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Original Contributions.

NASAL AND PHARYNGEAL OBSTRUCTION IN RELATION TO THE ORAL CAVITY.

BY J. M. INGERSOLL, M.D., ROCHESTER, N. Y., READ BEFORE THE ROCHESTER DENTAL SOCIETY.

The importance of the conditions and consequences indicated in the title of this paper should be impressed on the minds of the physicians and dentists who have charge of the health of the community.

Did it ever occur to you that both the physician and the dentist occupy positions of responsibility toward their patients involving not only the cure, but also the prevention of disease?

A man is lacking in his duty to those in his professional care who does not endeavor to prevent the occurrence of evil conditions so far as may be within his power, and to no one does the opportunity come more often than to the family physician and family dentist, whose opportunities for observation are practically unlimited.

It is not my purpose to present to you a long technical exposition of this subject, but rather to outline the various causes of mouth breathing, and the effects of such on the development of the oral cavity, and hope for a full and free discussion.

It would be asking too much of human nature to expect unanimous agreement with the points brought up, but I hope the discussion will prove of value not only to the persons present, but to many who may hereafter be brought to our notice.

As relating more closely to the points desired to be shown, I shall take up the consideration of "adenoid vegetations," so called, as the most frequent cause of obstruction to nasal breathing in children.

Probably the first person to recognize and describe this condition

was Czermak, in 1860, but the one to whom is due the honor of having studied and observed and drawn conclusions in regard to adenoids was Wilhelm Meyer, of Copenhagen, who, unfortunately, is now dead.

Meyer devoted some years to the study of this condition and its effects, and published his classical paper about 1868 or 1870.

In the pharynx is located a lymphoid structure known as Luschka's tonsil, or more commonly, the pharyngeal tonsil. This, like the normal faucial tonsil, is present in everyone, but only as a result of diseased action does it become a pathological factor. Under the influence of diseased action there appears in the pharynx a mass of tissue, which varies in size in different individuals.

The cause, or causes, of this growth seem to be obscure. It is recognized that the disease is essentially one of childhood. Probably no case of adenoid vegetations originated in a person who had arrived at adult age. The disease develops in infancy, and is, in some cases, probably congenital.

Heredity probably plays some part in the development of this tissue, as it is quite common to see the condition present in several children of one family. In my own experience I can cite several of such instances.

Löwenberg says that the "lymphatic temperament" is the "cause of the disease in the very large majority of the cases which he has seen."

"Scrofula" is assigned as the cause by other observers, but this seems to be a rather vague cause, as "scrofula" does not hold the same position in the affections of the profession that it did some years ago.

That there is an influence of heredity, however, seems borne out by the facts in so many cases that it deserves a place among the probable causes of this disease.

In one family in this city the same, or similar condition, is seen through three generations. I have had under my care four of the children, and four of the grandchildren of a couple, both of whom have had similar troubles themselves. Outside of hereditary tendency the trouble seems to be caused by inflammations affecting the pharynx, causing engorgement and hypertrophy of lymphoid structures.

Under the microscope these growths present no features which would allow them to be dignified with the term "tumors," but show that they are simply hyerplasia of lymph tissue; follicles, with a myxomatous reticulum, and a rather copious supply of blood vessels.

The symptoms of this condition are marked, and not at all difficult to read. In fact it seems strange that so many children are allowed to grow up with the condition unchanged by operative interference, when the symptoms are so plain, and the evil effects on the child's health so apparent. No matter what the age of the child, the symptoms are so similar in all cases that it is impossible to make a mistake.

In the first place, nasal breathing is so interfered with that the child has his mouth open almost constantly, and has a marked "vacant" expression of countenance. It is almost unnecessary to make a further examination when this symptom is so prominent.

The child is a poor sleeper, usually snoring loudly, and being quite restless, tossing about the bed, even while being sound asleep. The sleep may be profound and heavy, but the restlessness and noise tell the story accurately.

On awakening the child is usually still sleepy, tired and cross. The mouth breathing during sleep has supplied the brain with blood which has not been properly oxygenated and prepared for the use of the system, and there is a lack of refreshment from sleep which a perfectly healthy person would get.

Earache is a frequent symptom accompanying the conditions under consideration. The earache may be caused in several ways. If the growth is large enough, pressure on the opening of the Eustachian tube will produce an inflammation extending to the ear through the tube.

Some of the mucopurulent secretion, always present, may enter the tube and produce the action giving rise to earache. Earache is a common complaint of childhood, and it would be wise to have the pharynx of any child, complaining of earache, examined to know if adenoids be present. Nightmare is a frequently observed symptom, caused, no doubt, by the brain not being properly supplied with oxygen.

The faucial tonsils, when enlarged, are a cause of mouth breath-

ing in many persons, and should be considered in connection with this subject.

The faucial tonsils, in a normal state, are invisible to the naked eye, being merely a collection of follicles lying in the depression between the pillars of the fauces, and considerably below the level of the free edges of the pillars.

It is only when these follicles have been the seat of inflammation, or other causes of structural change, that one can see what is commonly known as the tonsil.

The tonsil then, as commonly so called, is a body of greater or less size projecting into the cavity of the mouth and throat from between the pillars of the fauces.

It consists of lymphoid tissue, follicles and connective tissue, with more or less fibroid tissue, in which is its chief point of difference with the pharyngeal tonsil.

The older the person the more fibroid tissue is the rule, and is always borne in mind when operating on these organs. It is probable that long-continued pressure, although intermittent, as in the act of swallowing, accounts for the greater development of fibrous tissue in the older tonsils.

The age of the tonsil, however, seems to have no bearing or influence on the relative size. Only last week I removed two tonsils from the throat of a child two and one-half years of age, which measured at least one inch in breadth. They met in the middle of the throat, and it was with great difficulty that the child was able to breathe.

While on this portion of our subject it might be well to say something about the unaccountable and unexcusable opposition to the removal of tonsils and adenoids shown by some persons, and not always persons who are ignorant or whose opportunities for acquiring knowledge are limited.

Physicians of wide reputation, only a few years ago opposed the removal of tonsils, or advised the removal of only a portion of the growth in case they were extremely large. So much has been written, and so much knowledge of the pathologic character of these growths has been disseminated within recent years, that the medical profession has made a distinct advance in its attitude toward this condition; but there is still widespread, ignorant preju-

dice against the operation which must be overcome, and it is our duty to help destroy it.

We are often met with this argument, "If Nature did not mean that such things should be there, why did she put them there?"

Such a question presupposes the infallibility of Nature's works, while anyone, endowed with even ordinary powers of observation, can see many times in any one day that Nature's work is far from perfect. Every knot on a tree, every blighted bud, every crooked limb, prove that, in a very common work of Nature, all is not as it should be. The enlarged tonsil has its champions even among the medical profession. It has been held that the tonsils are protectors of the lungs, by preventing the passage of deleterious germs. They are called phagocytes, and protect the stomach and lungs by such action.

But suppose a person breathes properly, through the nose, how does the tonsil get its opportunity to do its protecting act? And what of us poor mortals who have no tonsils, and never did have any?

A study of patients with adenoids or enlarged faucial tonsils, or both, will show some very interesting facts. There is a characteristic appearance to the face, more noticeable in proportion to the age of the patient, but distinguishable even in children of five or six years of age.

There is a "pinched" expression about the base of the nose, showing narrow openings of the nostrils, which in many cases are mere slits, the superior maxillary is flat, with a rather protruding or prominent alveolar process. The whole bone is apparently underdeveloped, and flattened from side to side, often having a distinct depression on each side at about the location of the cuspid and bicuspid teeth.

The arch of the palate presents varying degrees of height and narrowness. Usually there is present what is called "a high, narrow-arched palate."

This feature is so marked in some cases as to be startling. In one case the arch was so high that it raised the floor of the nostrils so much that no operation could be done to relieve the nasal obstruction, because the cutting away of the bony protuberance on

the floor of the nostril would have made an opening into the mouth, the patient having arrived at adult age.

All of you, as dentists, must be very familiar with this type, and have done more or less work in the correcting of the irregular teeth accompanying this condition. The irregularity of the teeth is one of the symptoms always present in these cases, for the reason that the maxillary bone has not developed sufficiently to allow the permanent teeth to be properly erupted.

These teeth are usually erupted from the seventh or eighth year until the fourteenth or fifteenth year, and, of course, during these years the child is attaining its development, and it is during these years that the effects of mouth-breathing are shown.

The reason of the malformation of the superior maxillary due to mouth-breathing is supposed to be due to the unequal air pressure on the horizontal plates, forcing them upwards, and narrowing the vault of the arch as well as the contour of the sides of the jaw.

I believe that the non-use of the nostrils for the purpose of breathing also results in imperfect development of the muscles of the face, particularly the levator muscles of the wings of the nose, and brings about an uneven balance of muscular action resulting in malformation of the growing tissues.

Often parents are advised to allow no operation for the removal of adenoids because they will disappear of their own accord if left alone.

There is just enough truth in this assertion to make it dangerous. It is a fact that, after the age of puberty, adenoids tend to diminish in size and disappear. But by the time that process has been completed the damage, irreparable damage, has been done.

The dentist has made wonderful progress in the treatment of jaw deformity and irregular teeth, but if the necessity for such treatment can be avoided, it should be done, and I am convinced that so much of it that is due to mouth-breathing can be avoided.

It is interesting to watch the development of children who have shown the characteristic symptoms of this disease. The change in appearance of the face is remarkable. It has been my privilege to see a number of such patients, and in every case, when the operation was done before the fifteenth year, improvement of the facial deformity was noticed.

If this condition is responsible for deformity of the jaw and roof of the mouth, what importance must be attached to the early operation for the removal of the cause. I am often asked what is the best age for the operation. I believe that the earlier the operation is done the better for the patient; not only on account of the probable malformation, but also for the benefit to the little sufferer in other ways. Only when the operation is done on quite young children, the chance of recurrence is increased, and such children should be carefully watched for possible recurrence.

I have said very little about other effects of these growths, as they hardly come within the scope of this paper, but it is well to bear in mind that adenoids constitute a prolific cause of middle ear disease in small children, bringing on deafness and other more serious complications.

THE BLOOD SUPPLY OF THE TEETH.

BY B. S. HERT, D.D.S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY.

The blood is a fluid which circulates throughout the entire system, taking to the various tissues the necessary materials for carrying on their work and conveying away their waste products. In the arteries it is of a bright scarlet color, and in the veins purplish, the difference being due to the larger amount of carbonic acid and smaller amount of oxygen in the latter. Chemically it consists of a number of substances, water and the proteids comprising by far the larger part. Its composition varies in different portions of the body and in different individuals, as well as in the same individual at different times. Its specific gravity ranges from 1,045 to 1,075 within the limits of health. It is alkaline in reaction, and its weight is about one-thirteenth of the entire body. Physically it is composed of a solid part, the corpuscles, and a liquid part called the plasma, the corpuscles being by weight from one-third to one-half of the total amount. The corpuscles are of two kinds: the red corpuscles, which are smaller and more numerous, and the white corpuscles; these are held suspended in the plasma, and it is the red corpuscles which give the color to the blood, the plasma being colorless. The number of corpuscles is enormous, the normal

average being 7,500 white and 5,000,000 red corpuscles in a cubic millimeter. Examinations of the blood are often made for clinical purposes and the corpuscles counted, which frequently assists materially in both diagnosis and prognosis.

One of the most striking properties of blood is that of coagulation. In this process the fibrin of the plasma enmeshes the corpuscles, these together forming the clot; the remaining liquid is called the serum. The blood leaving the left ventricle of the heart passes into the aorta; from the arch of this artery the first branch given off is the innominate, then the left common carotid and last the left subclavian; the innominate divides into the right common carotid and right subclavian; the common carotid artery passes up the side of the neck, until about on a level with the thyroid cartilage, where it divides into the internal and external carotids. The external carotid continues up the side of the neck and head, until just forward of the lower end of the ear, where it divides into the internal maxillary and temporal. It is from branches of the internal maxillary that all the teeth obtain their blood supply. This artery, beginning in the parotid gland just in front of the lower end of the lobe of the ear, passes to the inner side of the neck of the condyle of the lower jaw, and then forward to supply the deep parts of the face. It is divided into three portions: the maxillary, the pterygoid and the spheno-maxillary. The first division, the maxillary, gives off, among other branches, the inferior dental, which supplies all the lower teeth. The third division, the spheno-maxillary, gives off a branch which almost immediately divides into the alveolar, or posterior dental, and the infra-orbital; the former going to the upper molars and bicuspids, the latter to the cuspids and incisors. After leaving the internal maxillary artery, the inferior dental passes down on the inner surface of the ramus to the inferior dental foramen, where it enters the inferior dental canal, passing through this to the symphysis and here anastomosing with the artery from the opposite side; during its passage through the canal it gives off branches, one to each root, these passing through branch canals to the apical space. The posterior dental branch of the internal maxillary passes through a foramen on the posterior surface of the tuberosity of the superior maxilla to a groove on the inner surface of the outer wall of the antrum, along

which it passes, giving branches to the molars and bicuspids, and finally anastomosing with the anterior dental branch of the infra-orbital. The anterior branch of the intra-orbital passes downward from near the infra-orbital foramen, in a canal in the anterior wall of the maxilla, and supplies the cuspids and incisors.

When the blood vessel reaches the apical space it divides, one portion supplying the pericementum, and the other passing, usually by one but sometimes three or more branches, through the apex of the root to supply the pulp. The arteries in the pericementum, in their progress toward the cervix of the tooth, frequently divide, giving the pericementum many arteries; it has, however, but few capillaries. The branches frequently anastomose with arteries from the surrounding alveolus and gums, and thus if its original source at the apex should be cut off, the pericementum would still receive a plentiful supply of blood through the bone and be well nourished, capable of continuing to perform its functions. The arteries entering the tooth at the apex as one large or several small ones, branch repeatedly, growing gradually smaller and ending in a network of capillaries, just within the layer of Weil; occasionally, however, passing through this and penetrating between the odontoblasts. In both the pericementum and pulp there are numerous veins accompanying the arteries. According to one author, in the pulp of a cuspid cut across at the cervical portion, there were found ten arteries, twenty-four veins and countless capillaries. These figures give an approximate idea of the number of larger blood vessels in a tooth, the actual number varying more or less in different teeth.

In the formative period the tooth is necessarily freely vascularized. There are two sets of blood vessels, the external and internal, the former supplying the tissues which are epiblastic in origin, including the gums and enamel organ, and the latter to those from the mesoblastic, including dental papilla, dental sac and surrounding bone. Of the enamel organ the outer epithelial layer and stellate reticulum have no blood supply but one or two large non-branching arteries pass through them, these on reaching the stratum intermedium suddenly break up into numbers of small capillaries supplying it and the internal epithelial layer. Over the ameloblasts the capillaries are very numerous caused by the fact that these cells

are very active in the formation of the enamel and like all formative tissues require a very free supply of blood. The dentin organ has one large vessel entering the apical foramen which with many curvatures passes up the center of the tooth to near the newly formed dentin. As it passes toward the surface of the papilla branches are given off irregularly and leave the main trunk at a considerable angle, sometimes even at right angles. The terminal branches run parallel to the dentogenetic zone close to the odontoblasts between and around which their ultimate ramifications are distributed and freely anastomose. "The advantage of this peculiar method of arrangement—the sinuous primary arterial trunk, the branches coming off at right angles, the minute anastomosis beneath the dentin—are manifest at once. It is evident that they are thus distributed, first to give as large an area of blood supply to the pulp tissues in as small a space as possible; and, second, to prevent shock or any other extraneous influence from acting injuriously on its delicate elements. In this manner ,a flow of blood to the part is maintained, constant and uniform, two necessary factors in the production of perfect development, growth and nourishment." It is uncertain just how the cementum obtains its nourishment, but it is supposed to be through the medium of the pericementum by means of protoplasmic exudates entering the cementum in the channels containing Sharpey's perforating fibres. During this time the pericementum receives blood from three sources as in adult life; from the pulp, from the gum and from the alevolus, these freely anatomose and in this membrane the external and internal sets of blood vessels join and form thick plexuses which nourish this extremely important tissue in dental anatomy.

ORAL PROPHYLAXIS.

BY W. W. SMITH, D.D.S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY.

In beginning the consideration of this subject I commenced to read, and found that in almost any dental journal of recent date could be found from one to a half dozen articles pertaining to it, treating on all its phases. There seemed to be nothing left to be said—that is from our present standard of knowledge. The different views expressed in these articles and the extreme and

positive statements made in some of them are bewildering, and I was lost in reverie and dreamed of spending centuries in the study of chemistry, bacteriology, physiology and hygiene; then a voice came to me from a still higher realm saying, "You have done well, but there are laws governing the universe of which you have as yet only a glimmering, and there are compensating influences that you have not yet fully considered in your so-called scientific investigations." I awoke with the conviction of our present limitations, also with the conviction that our present duty lies in acting in harmony with existing conditions.

What I shall say is founded on practical lessons gleaned from the sayings and writings of others and an experience of about thirty years in the practice of dentistry. I trust an evening's discussion of the subject will be profitable.

Our highest ambition should be to prevent rather than cure disease. We should aim as far as possible to procure and maintain a hygienic, physiologic condition; for in a state of perfect health infection will be reduced to a minimum, if not made impossible.

All will admit the tendency to specialize has its advantage in developing a high order of skill in the various specialties, but that it has an element of danger is very obvious in its tendency to narrow the vision to a point where a broad comprehension of a case or a condition is not possible.

The influence of the organs that come within the realm of the specialist, upon other organs or the entire system, as well as that of other, or all other organs upon them, is not properly considered. The needless sacrifice of valuable organs interfering with their natural functions and thus disturbing the equilibrum of the system, and the extreme views expressed minifying the importance of these organs and magnifying the dangers attending both a normal and a pathologic condition of these various parts of the human system, and the multitudinous rules given for treatment and care, are to say the least confusing, and to believe them all would be to charge the Creator with making a colossal blunder. The chances are that the patient who has gone the rounds of these various specialists will be poisoned by fear, and if he should attempt to follow out the instruction he has received would be occupied to the full extent of his time and he very naturally looks with suspicion upon any

new system of treatment—and it is well that he does—it is his only safeguard.

The foregoing extreme statements are made not with a view of depreciating the efforts of enthusiastic workers in these lines, but as a word of warning, especially to young practitioners, to guard against the tendency to magnify the harmful effects due to mouth conditions and look upon this organ as the principal source of infection in a majority of prevalent diseases, losing sight of the fact that other organs and systemic conditions may be important factors in mouth infection; but rather to be conservative and instead of following the teachings of any one glean from all and apply the knowledge thus obtained to existing conditions, keeping in mind the fact that to be in a high sense successful in our work we must first prove to ourselves that we are right, then show results, which is by far the most successful kind of teaching. "The world cares more for what we do than what we know."

Doubtless the impression conveyed in the foregoing is that the subject is being treated too lightly. Briefly, the situation as I understand it is as follows:

1. It is the most important subject before the dental profession to-day, and a large majority of dentists are either indifferent or do not begin to comprehend its importance.

2. The medical profession is considering the matter as never before. A prominent physician said to me last week, "You dentists are giving all your time to filling and refilling teeth and curing diseases of the mouth instead of using means of prevention." I was glad to be able to convince him that he saw only surface indications and that a considerable number of dentists are giving the matter of prophylaxis much attention and that it is a live subject in the profession to-day.

A lady who has had large experience as a nurse and as superintendent of an important hospital and editor of a journal of nursing said to me recently, "I am very glad to know that you dentists are giving attention to educating the people in the care of the teeth, as I consider it of great importance."

3. The laity are becoming interested and not a few are demanding this sort of treatment, while others only need to see results to become interested.

Very little need be said about mouth conditions, as all present are familiar with them.

That systemic infection is sometimes due to mouth conditions has been demonstrated; that caries of the teeth, pyorrhea alveolaris and other diseases of the oral cavity are at least greatly augmented by local conditions is also obvious, that systemic conditions are important factors in these oral diseases is also apparent to the observing practitioner; that uremia, which is so often associated with pyorrhea, is caused by mouth conditions may sometimes be the case, but that uremia *does* sometimes manifest itself as the *cause* of pyorrhea is, to my mind, in accord with clinical practice.

This phase of the subject is presented not with a view to enter into its discussion, for it is time-worn, but that we may consider our subject from a broad standpoint.

A system that rebels against a small amount of septic matter in the mouth at first, may, after a gradual accumulation, be indifferent to a condition of absolute filth, yet no one will agree that such a condition is desirable or that the equilibrium may not be disturbed and serious results follow.

A clean mouth with teeth and pericemental tissues in perfect form, glowing with vital energy, is a thing of beauty and an ideal condition which we should try to assimilate as far as possible.

A half dozen members of this society could be named, and the same rule would, I presume, hold good in other societies, who for a period ranging from fifteen to thirty years have practiced to a greater or less extent oral cleanliness, have removed superficial decay with frequent polishings of these and all other rough surfaces and in addition to this have spent much time in exhorting their patients to use their teeth in masticating hard and dry food, pointing out to them the depraved condition of the mouth on the side that did not happen to be thus used and the lifelike and healthy condition of the teeth and surrounding parts on the side that was most used, and all this with a view of "stimulating vital energy," but I think it can be safely stated that this has been done without a clear conception of the extent to which this principle can, and is to-day carried with beneficial results.

To Dr. D. D. Smith, of Philadelphia, is due the credit of extending this principle and not only demonstrating in his own practice the

far-reaching effects, but has awakened an interest in the subject which is changing the trend of professional thought and practice. Doubtless all present are familiar with his writings and mode of practice. He says in part: "I have spoken of the prophylactic treatment as a process to effect and maintain complete change in tooth environment, and such it is, and the beneficial results are in direct ratio with the accomplishment of this result and the perfection with which it is maintained. It consists in the *forcible* and *positive* change of tooth surroundings from bad to good, from harmful to beneficial, from acid to neutral, from culture producing plaques of the teeth to a germ-freed immune surface. But is this feasible or practical, or is it a scheme of the imagination only? In answer to this let me here give some attention to the methods pursued. Briefly stated, treatment of the teeth for complete change of environment consists in thorough removal at frequent and regular intervals—once a month has thus far proved most satisfactory—of all accumulations, whether solids or bacterial formation from all the exposed surfaces of the teeth, leaving the enamel, or whatever of the tooth may be exposed, thoroughly polished and thus in the best condition to avoid hurtful deposits and equally to favor all efforts of the patient in the direction of cleanliness."

In another place he says, "The time limit thus far found to produce the most satisfactory results for the arrest of caries is for frail temporary teeth, two to three weeks; for adults, once a month."

Dr. Smith's method is to remove all calcarious deposits by instrumentation and the polishing of all the surfaces with orange wood sticks and pumice, always to be used in the hand, condemning emphatically the use of the dental engine.

From reports that have come to me of Dr. Smith's cases and my own experience, I have great confidence in this mode of treatment in cases where it is indicated and practiced discriminatingly.

The change that can, in many cases, be proudced from a filthy mouth with teeth that present a lifeless appearance, and gums presenting an irritated and unhealthy appearance, to one that is glowing with health, and with teeth that are, to a more or less extent, immune from caries, is an inspiration and demands our most careful consideration.

Now as to the practical application of these methods in our

everyday practice. We have to consider what is possible to do under existing circumstances, striving always to approach, as far as possible, the ideal. I ask your pardon for giving my mode of procedure in cases as they come to me, for by this method I can best make clear my opinion.

A patient is very rarely told that in her mouth are lurking dangerous pathogenic bacteria, or in any way try to frighten her, but on the contrary try to eliminate as far as possible the element of fear which is, I believe, a factor in pathologic conditions. Show her the advantages of an improved condition and she will usually consent to any method of practice which will maintain such a condition.

Just as rarely is one told that a new method is being practiced. Yesterday a new patient came in for an examination saying she wished to place her teeth under my care, and made some inquiries as to what should be done; as is my almost invariable rule, I gave her an appointment for cleaning and polishing and said to her that I would know more about what would be required after that.

Now as to the method I shall pursue when she comes: First remove all projecting portions from fillings, grind out and polish surfaces where superficial decay has taken place but do not require filling, grind down and polish all sharp and roughened surfaces, remove all calcarious deposits with scaling instruments, using the kind that have proven to be the most effectual in my own hands. For the grinding and polishing I will use emery and Arkansas wheels shaped to meet the requirements of the different positions requiring their use; files and sand-paper strips will be used to remove projecting portions of fillings in interdental spaces, then all surfaces will be polished, using first leather discs or wheels, then a soft rubber point, which is in the form of a concave disc, after which use a soft rubber cup of medium size first inverted on the mandrel for reaching the lingual and posterior surfaces, then reverse the cup to reach the labial and buccal surfaces; these are used with the engine and are, if skillfully used, well adapted to reach nearly all surfaces of the teeth; the cups can be made to adapt themselves admirably to the festoons of the gums and greatly facilitate the process of cleaning and polishing the rough surfaces, and if skillfully used I see no objection to their use. This is fol-

lowed by hand polishing with orangewood sticks, used in the porte polisher, and on all surfaces that can be reached in this manner; then the approximate surfaces that are in close contact are polished, using the Parmly-Brown strips; this is followed with a concave brush which cleanses the sulci on the different surfaces; pumice is used dry on the instruments mentioned, which are previously wet with dilute hydrogen dioxid; this is followed by use of floss silk and a spray from an atomizer of some antiseptic preparation, usually Phenol-Sodique. During this process I will look for any indications of devitalized teeth that have not been properly treated or any other unhealthy condition. I will have become acquainted with the condition of her mouth and with her, and she with me, and future appointments made understandingly.

About six months ago a new patient presented for advice. The molars and part of the bicuspids were missing and the teeth remaining were badly decayed and loose, with roots exposed to a considerable extent and presenting a very unhealthy appearance; the teeth had been filled and refilled and she despaired of keeping them much longer, in fact expected that I would advise extraction. I first gave them a thorough cleaning and polishing, as in the case last mentioned; quite extended, but superficial decay had taken place at the roots of two of them, this was removed and the surfaces polished; then the cavities of decay were filled and she was requested to return in a month, at which time her mouth was very much improved and the polishing was a much simpler matter. She was delighted with the improved condition, which was so apparent. I requested her to make another appointment for the following month, at which time the teeth required but very little polishing, which was done entirely by hand; an appointment was then made for two months in advance, at which time I suggested that the time for her next visit be extended to three months; she replied she would rather come again in two, or even one month, than take the chances of a recurrence of the unhealthy condition, although she lives in a town quite removed from the city and it is not an easy matter for her to make the visits. Her teeth are very much firmer in their sockets and the surfaces including the two that required such extended grinding present a hard and life-like appearance and the gums are in a healthy condition. She was, on

her first visit, given some orangewood sticks with instructions as to their use. At each sitting, in addition to the polishing, her gums received a thorough massaging.

About three months ago an elderly lady, who has been a patient of mine about four years, telephoned for an appointment. She has been troubled with pyorrhea for several years. When she came her teeth were found to be in a hypersensitive condition with gums irritated and swollen. She is of a gouty diathesis and was under treatment for rheumatism. I suggestd that she acquaint her physician with the mouth conditions and dismissed her. She came again last week with sensitiveness almost entirely gone and general mouth conditions much improved; to have attempted any sort of local treatment at time of first visit would have caused her unnecessary suffering and I believe would have aggravated the trouble.

A lady of about thirty with well-kept mouth that is free from any indication of pyorrhea but teeth are below the medium in structure and require a large amout of filling would have rebelled against any "new method" that required monthly visits for cleansing and polishing and yet on request that she come "another month," which request was repeated for several months till the results were so apparent in improving the structure of the teeth she now demands a continuation of the monthly treatments.

About twenty-five years ago a mother came to me after the birth of her first child with large, but not deep, labical cavities and very sensitive. (Her teeth had been previously good.) I ground down and polished the surfaces and this was repeated at intervals of about three to six months and was persisted in during her future gestation periods. Most of these surfaces are still without fillings.

A lady patient said to me last week: "My little girl, four years old, has an unsightly deposit on her teeth, can anything be done for them?" I said, bring her in and I shall be pleased to advise you in regard to her teeth. If I am adroit enough in managing the child and skillful enough in producing results a service can be rendered that will be of incalculable value to her in future years.

The results that follow the discriminating practice of these principles in the mouth of children are far greater than in those of adults and the dentist who is true to his calling is often called

upon to render service to children for which he is not properly remunerated.

In closing, let me exhort each one present to give the subject of oral prophylaxis more study and attention than any other subject, as it is the most important.

THE GOSPEL OF LABOR.

BY L. G. NOEL, D.D.S., NASHVILLE, TENN. READ BEFORE THE ALUMNI SOCIETY OF THE PHILADELPHIA DENTAL COLLEGE.

Emilie Zola says, "Labor! Remember, that is the unique natural law of the world, the regulator which leads organized matter to its unknown goal. Life has no other meaning, no other *raison d'etre.* We only appear on this earth in order that we may each contribute our share of labor and disappear. One can only define life by that motion which is communicated to it, and which transmits, and which after all is but so much labor toward the great final work to be accomplished in the depths of the ages."

"Why, then, should we not be modest, why should we not accept the respective tasks that each of us comes here to fulfill without rebellion, without giving way to the pride of egotism which prompts men to consider themselves centers of gravity and deters them from falling into the ranks with their fellows."

It is the law of nature that life is motion, and when motion ceases we call it death. Tennyson expresses it thus in The Lotos Eaters. "Death is the end of life, ah! why should life all labor be?"

When we look into Nature's laboratory for the cause of life, the answer she gives us is motion. Heat, light, and electricity are all modes of motion, and factors in the production of life. Carlyle shows us how chaos was first set in motion like the potter's wheel and thus matter was whirled into shape and a world formed. "Even such a potter were Destiny that would rest and lie at ease, that would not work and spin."

Since creation's dawn when God, the Great Potter, set His wheels spinning in the nebulous chaos of space to create worlds of the unformed matter, His law of motion has been in force and must be forever.

Our finite minds cannot reach back to the beginning of motion,

nor can we comprehend the end. Since the human mind cannot define God, we cannot limit His works which ever were and ever shall be world without end, Amen!

Neither can we comprehend the problem of organic life which only God can establish and maintain: we know that it is motion, action, labor, and that when activity ceases in an organism we call it death; that death is but a change whereby other organisms come into existence and are maintained.

In life we are in the midst of death, and without death life cannot be maintained. Life from the lowest to the highest forms of organisms is maintained by the lower contributing to the growth and development of the higher.

It is a constant struggle, the higher order preying upon the lower throughout all the kingdoms of existence.

Though we may not comprehend life in its subtle essence, we may acquaint ourselves with many of the conditions, and as we study these we can but admire the wisdom and beauty of the divine plan of labor by which development is carried forward and existence is maintained. It is the law of God that men shall work: "Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life. Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field. In the sweat of thy brow shalt thou eat bread." Staggering under the burden of Adam's curse have we not overlooked the beneficence of God in so exactly fitting his punishment to our needs and turning it into a blessing? Is not this shadowed forth in the clause "for thy sake."

From the hour of birth to the time when we come to the bed of death, physical and mental activity is necessary to our well being. The perpetual motion of the infant during its waking moments is in accordance with Nature's design to the end that all its muscles shall be fully developed, and that all its parts may at last attain to a symmetrical completeness.

And so all through the years of growth, exercise is necessary to growth and health; and after the period of adolescence is reached it must be continued in order to maintain the even balance between waste and repair so necessary to health.

This ncessary exercise is all the more beneficial when it is ob-

tained in the daily discharge of our duties—when it comes through the performance of our allotted tasks.

It would seem that the mind goes through a similar process of growth and development, for the acquisition of knowledge is a gradual process and the reasoning powers are strengthened as additions are made to the store and these are brought into use.

The process of mental development is doubtless very analogous to that which takes place in the muscular system. This is easy to demonstrate by cultivating the powers of the memory in children. When the first efforts are made to memorize passages from books, the process is slow and laborious, but if persistent effort is made it becomes easy to commit long extracts, and sometimes after reading them over attentively the pupil can recite page after page without omissions.

The memory can also be cultivated in many of the lower animals, and it appears to be not intimately associated with the reasoning faculties.

The mind requires constant exercise in order to preserve its health and vigor, and when permitted to pass through long periods of inactivity it loses its tone, as is the case with the body when slothful habits are indulged.

For the maintenance of mental health and vigor bodily health and vigor must be preserved, and most psychologists agree in the belief that the converse is also true.

Idleness is a breech of Nature's laws and as such must meet the just and inevitable penalties that God has set upon them. What are these penalties? For the body, faulty development, derangement of function resulting in ill health in many forms, imperfect maturity if it be ever reached, premature decay and death. For the mind the penalty for persistent slothfulness and inactivity is faulty development, derangement of function, mental atrophy, moral obliquity tending to crime, finally insanity and death; perhaps the death of the soul! Who can say?

For examples of these effects upon the mind produced by long periods of enforced idleness, you have but to look over the records of the prisons during the dark ages when prisoners were subjected to long periods of solitary confinement without the beneficent effects of employment; often confined in dungeons where the light of day

could not enter; in straight jackets or in fetters; a prey to the horrors of solitude and remorse.

The strongest bodies and minds failed under these conditions; the most stubborn spirits were soon broken, and men of *giant* intellects soon lapsed into gibbering idiots or raving maniacs. This is history. Prison reforms commenced with the work of John Howard who sacrificed his life in the noble work, but did not live to see the wholesome effects of the introduction of useful labor and sanitary reform into the foul prison dens of Europe that agonized his gentle soul. This glorious work is beautifully told by Charles Reade in one of his novels, in which he gives a graphic picture of the misery of enforced idleness and solitary confinement.

Our Heavenly Father in pity for our weakness, turned the curse of Adam into the greatest blessing, for he has so constituted man that his health and happiness absolutely depend upon work. To be happy and healthy, sound in mind and body, he must be employed. Each individual must find work that is congenial to his tastes; work that he loves and that he can do well.

Carlyle says, "The latest gospel in this world is, know thy work and do it well. . . . .

"Think it not thy business, this of knowing thyself; thou art an unknowable individual; know what thou canst work at and work at it like a Hercules. . . . .

"Consider how even in the meanest sorts of labor the whole soul of a man is composed into a kind of real harmony the instant he sets himself to work!

"Doubt, Desire, Sorrow, Remorse, Indignation, Despair itself, all these like hell dogs lie beleaguring the soul of the poor day worker, as of every man; but as he bends himself with a free valor against his task all these are stilled, all these shrink murmuring afar off into their caves. The man is now a man. The blessed glow of labor is in him, is it not a purifying fire wherein all poison is burnt up and of some smoke itself there is made bright blessed flame?

"Blessed is he who has found his work; let him ask no other blessedness. He has a work, a life purpose; he has found it and will follow it!

"How as the free flowing channel, dug and torn by noble force

through the sour mud swamp of one's existence; like an ever deepening river there, it runs and flows draining off the sour festering water gradually from the root of the remotest grass blade, making, instead of a pestilential swamp, a green fruitful meadow with its clear flowing stream. . . . .

"Labor is life. From the inmost heart of the worker rises his God-given force; the sacred celestial life essence breathed into him by Almighty God, from his inmost heart awakens him to all nobleness, to all knowledge, 'self-knowledge' and all else as soon as work fitly begins."

I exhort you, therefore, my friends and fellow alumni, be diligent in your chosen life work, since it has been clearly established by the philosophers and sages of earth that labor brings health, strength, beauty, wealth, contentment and happiness. Congenial employment is happiness. We can be happy, however, when engaged in the performance of duties that are most distasteful to us, if we train ourselves to a valiant devotion to duty, making it our religion to take up each task as it presents itself and no matter how Herculean it may loom up before us, go bravely at it to conquer or die. We shall find ourselves invincible if we put on this armor of duty, and all tasks but shrinking cowards before us.

Someone will probably say, "But I do not like my work, have never liked it. I follow it not for the love of it, but for the living I get out of it."

To such I will say you will find your love for your work will grow in proportion as you put your might into it.

There is no calling known to man that presents no difficulties, no ugly phases, no disagreeable duties. Work would become monotonous if all our duties were old tasks oft performed, easy because familiar. It is the excitement of solving new problems, encountering difficulties and marking out new channels that lends interest to our work. If life could be one endless current of pleasurable sensations we should lose the distinction between pleasure and pain. If all objects in nature could be beautiful, we should lose the sense of beauty for want of comparison; hence it becomes apparent that "variety is indeed the spice of life," and our work is relished all the more when varied by ever-recurring difficulties relieved by pleasant tasks.

The constant faithful performance of our meanest daily tasks will work out our own development and round our characters into beauty and symmetry.

Our work may be distasteful at first, begriming, monotonous, unlovely, but the effect upon our own souls of a daily devotion to the welfare of others, the faithful serving of those who look to us for service, will make of our lives the polished diamond, the finished poem.

Is your ideal the perfection of your skill in a certain operation that is especially pleasing and interesting to you?

You cannot attain to perfection in it without industrious application to the study and mastery of its details. Study that you may comprehend all the principles involved, and the methods of others who have left you the results of their labors in that particular work, then add your own original improvements and by the oft-repeated performances finish and perfect yourself in all the minute details until you can add nothing more. When you shall have reached this degree of perfection, if your aim is high and your enthusiasm what it should be in one who is worthy of his calling, your ideal will still be far beyond, dazzlingly beautiful, elusive, seemingly unattainable.

You will, nevertheless, have obtained a rich reward in the superiority of your work over that of others, in the appreciation and remuneration of your patrons, and in the applause of your confreres. But you will have a far richer reward in the effect upon your own moral and intellectual nature which will have been uplifted and purified by your struggle with the hard problems of your work; for while thus employed the soul rises above the foul vapors of earth to an atmosphere that is healthful to our moral natures, to a region of usefulness and happiness.

For the encouragement of any who are disheartened over the practical details of dentistry, if any such there be in my audience, I will preach Carlyle's Gospel of Work. Find your work in the domain of your chosen calling. The field is large, the opportunities are various, the rewards are worthy of any effort. Before you turn to another calling and waste yet more years of study, look well into the numerous specialties presented to you by your chosen profession to which you have already given so many years of your

life, and see if there is not some one thing that you can love and put your heart into. If you can make such choice, you are blessed, you are saved. Is it prosthetic dentistry? Here is a life work greater than that undertaken by Stradivarius when he set to work to perfect the violin. Greater, because you cannot find two practical cases alike, and your work is the restoration of an instrument that was the handiwork of the Master of Masters, and which the hand of man cannot restore.

In an essay on the value of specialization in our profession read before the New York State Dental Association at a recent date, Mr. Elbert Hubbard, a gifted layman, used the examples of Stradivarius and his pupils, the Guarnerii Brothers, in their lifetime labor of perfecting the violin, and told most beautifully the story of how the old master was in his old age excelled in his chosen work by Joseph Guarnerius; of how it was his custom to practice in a certain church in Cremona, and one day repairing thither for this purpose upon entering the church he was greeted by the tones of a violin that were so sweet and ravishing to the ear, the old man thought the instrument and performer both must belong to a celestial orchestra. Imagine his surprise upon finding it was Joseph, his pupil, but not his Stradivarius! An improvement, a far greater violin than Joseph had made himself, an instrument that never has since been equaled, and that is still the king of violins.

Go thou, and do likewise. If general practice has no charms for you, concentrate all your energies, all your skill, all your knowledge, all your devotion upon one life work, and if you do not live to see perfection you may at least rejoice in the attainments of a pupil who, after your work as an incentive, may carry it to yet greater finish.

If prosthetic work has no charm for you, try orthodontia. Surely you can be beguiled of your ennui while pursuing the intricate mazes of this department of our calling; and if it pleases you, few will object to your occupancy of the field—you can enjoy a large domain with undisputed sway—for the harvest is great and the laborers are few.

Truly this is a noble department of surgery. The correction of oral deformities; a work calling for the highest order of skill, inventive genius and almost superhuman patience. For this reason

the competitiors are few, and the opportunities great. If the correction of malocclusions and expansion of concentrated arches have no charm, perhaps you may find your work in oral surgery proper, in operations for the closure of cleft palate and hare lip, in the surgery of the mouth, face and jaws. Here again are great opportunities; notwithstanding the accomplishments of the last half century in this branch of surgery, much remains to be done and rich discoveries await the diligent student in this domain. If none of these things please you, if I have not yet struck the note that is attuned with the chords of your being, if not one fiber in your soul responds to these sounds, I smile complacently, for the harp of our calling has many strings and the range of its harmonies is great; I do not despair of striking the right chord at last.

A new specialty has of late years opened up to those who would concentrate their energies upon one all-engrossing work. Porcelain art! Here, indeed, is a most fascinating employment; a work that is clearly beautiful, scientific and calling for good eyes, steady hands, best judgment—in short, the very highest skill. Many are finding their work, and rich reward, too, in the wide range of application of porcelain art to dentistry, and in skilled hands it is rapidly displacing the unsightly gold fillings and gold crowns that have been disfiguring the mouths of their patients.

A young man once asked Mr. Chauncey Depew to tell him the secret of success. "There is no secret to it," said Mr. Depew, "it is simply dig, dig, dig."

Now that is true of all kinds of success. There are many kinds of success, and you must make up your mind what sort of success you desire to win, then set to work to achieve it. The short road to it will be apparent when you locate it. You must sight it first, then head for it—cut across lots, as it were. This is to be done by turning your face toward the goal and doing all your travel in that direction; make no side excursions, no detours. In short, find your favorite, special work and concentrate all your energies upon it until you have perfected yourself in it.

The day dreams of youth usually picture success as a golden sunset in a sky all suffused with auriferous colors, but those who really win renown by great deeds, the great inventors and discoverers, who benefit mankind by their work, seldom live to ac-

quire wealth or fame, but their work is immortal, and after all this is the highest degree of success. Horace Wells, the discoverer of anæsthesia, made a great success of his life, and his name will be printed among the illustrious throughout all the annals of medicine, notwithstanding he died a poor man. Barnum, the inventor of the rubber dam, had a fortune in his grasp, but preferred to give this discovery to his profession. Seeing it already patent-ridden, until charity practice was almost impossible, he gave it for the good of humanity. Call you not this success? Success does not depend upon making some grand and notable discovery like these, but may take many forms. The enthusiastic worker in any department of a profession may uplift and improve it in many apparently insignificant contributions, but in the aggregate he gives his co-laborers a mighty help upward and becomes a blessing to all within the sphere of his influence.

M. H. Webb, of beloved memory, that delicate little Pennsylvanian whose pallid girlish face was for a few brief but busy years always to be seen at the meetings of the old American Dental Association, was an example of this truth.

Was not his short life a success, which he gave so freely to perfect the operation of filling the teeth with gold? Has he not left behind him methods and instruments that will live longer in the memories of the followers of his calling than if he had amassed a great fortune? Such were the lives of Harris, Arthur, Atkinson, Bonwill, Flagg, Varney, Taft, McQuillen, and a host of those who have labored with us in our profession and crossed over the dark river. They left no great estates to their families, but bequeathed great riches to us. Call you not this success?

We can accustom ourselves to economize our time, and so order or systematize our work that we need not suffer remorse for wasted hours. In doing this we must not lose sight of the benefits to be derived from healthful and relaxing amusement; the necessity for outdoor life and exercise; but all these diversions and hygienic changes may be enjoyed by carefully systematizing our work, by early rising, by moderate indulgence in the pleasures of the table, and a careful observance of the laws of health. Bulwer, in describing Guy Darrell, the greatest character of his greatest novel, alluded to his systematic habits as follows:

"It was the habit of Darrell, if he went late to rest, to rise early. He never allowed himself more than five hours' sleep. A greater man than Guy Darrell—Sir Walter Raleigh—carved from the solid day no larger a slice for Morpheus. And it was this habit perhaps, yet more than temperance in diet, which preserved to Darrell his remarkable youthfulness of aspect and frame, so that at fifty-two he looked and really was younger than many a strong man of thirty-five. For certain it is that on entering middle life he who would keep his brain clear, his step elastic, his muscles from fleshiness, his nerves from tremor—in a word retain his youth in spite of the register, should beware of long slumbers. Nothing ages like laziness."

You will find no better suggestion in all the literature of hygiene, as far as I know, than this. Get your fresh air and exercise early in the morning. See the sun rise, hear the birds sing, listen to the song of praise to God that goes up from all awakening things, birds, flowers, plants and trees, and you will join in the anthem with a glad heart.

By carefully systematizing our work, and taking up each duty in the order in which it should come, we may avoid the most dreaded wearing and exhausting evil that menaces a busy life and that is a *worry*. If you would live long and enjoy your work, do not worry. If you would banish worry, rise early, have a time to perform each duty, do each thing at the right time, do only one thing at a time, do each thing thoroughly and well so that it will be done when it is done.

There is so much wisdom in that quotation from Macbeth that I must put it before you entire.

"If it were done when 'tis done, then 'twere well."

All that I have said in the foregoing may be summed up by another quotation from the Bard of Avon: "To thine ownself be true, and it must follow as the night the day, thou canst not then be false to any man."

We are gathered here to-day to do honor to our Alma Mater. Some of us are young men just starting out on a professional career, bearing the diploma of the Philadelphia Dental College

signed by its Board of Trustees and its corps of teachers, as evidence of qualifications to practice.

To such I would say, "Remember the duty you owe to your college!"

When you left your father's roof he probably gave you a solemn charge to take care of the family name; to keep it unsullied by living a correct life and governing your conduct according to the rules regulating the lives of Christian gentlemen.

Remember that our family honor—that the name of our dear old P. D. C. and our Alumni Society is in your keeping. Let us not blush for any unethical conduct, nor any unprofessional act of yours; but keep the thought ever in mind that your duty to your college positively demands of you the achievement of professional success.

Your Alma Mater gave you on Commencement Day a charge to keep.

It behooves you to be prepared to return to her treasury her own with interest, and not put away her talents in a napkin for safe keeping.

Let those of us who are well out on the road and who are already footsore and weary, feeling the heat and burden of the day, pause at this milestone and drink fresh inspiration from the maternal fount, then press forward after the illustrious fellows who have gone on before, and who have, by their great achievements long since, enjoyed places upon the honor roll of our society.

I rejoice that there are many of our old graduates who have made for themselves and for our dear old P. D. C. fame and distinction.

No other school of her years and like number of graduates can show a brighter record.

Then let us rally 'round her standard and join hands and hearts to-day for her glory and distinction.

Let the new graduates join hands with us and let us carry the chain back through the 90's, 80's, 70's (and the 60's and see if we can find any of those old fellows alive) and all enter into a sacred trust pledged to do something before we die to shed glory upon our Alma Mater; the school we love.

Digests.

PYORRHEA ALVEOLARIS IN ITS SURGICAL ASPECTS. By F. L. Fossume, New York. I use the inadequate term, Pyorrhea Alveolaris, because dental nomenclature has no better name for that pathologic process, where the tissues of the mouth supporting the teeth undergo degeneration and absorption resulting in the loosening of these organs, and the development of pericemental abscesses.

Before any attempt is made to treat a disease the causes back of it should be studied, and I shall consider the causes of the breakdown of the alveolar tissues so far as to give a clear and correct understanding of what we as dental surgeons are combating when we undertake its treatment and eradication.

In this paper I will endeavor to express my views regarding the etiology of pyorrhea alveolaris, and to outline the diagnosis and surgical treatment. No review will be made of the history of this disease, since it became a distinct branch of dental science, nor will time permit of much discussion of the various theories pertaining to the solution of its etiology.

I believe there are comparatively few men among those who have given this malady serious thought, who believe pyorrhea is of local origin, that is, that the true cause is a local irritation, followed by inflammation and infection.

There are probably still fewer of our profession who have not encountered cases of pyorrhea alveolaris which refused to yield to local treatment, although the treatment was as carefully and conscientiously applied as in cases which were readily cured. But even the successful cases of local treatment require subsequent and constant treatment, because the same pathologic manifestations usually reoccur within a certain period of time, varying with the severity of the etiologic factors.

I have found that the general opinion among dentists is that pyorrhea alveolaris when well advanced is incurable, and this opinion is entitled to earnest consideration. On the other hand, there are some who have given pyorrhea a deep and careful study, who claim, and I agree with them, that it can be cured by the application of radical surgical interference, in conjunction with

the eradication of the constitutional derangement predisposing and causing the breakdown of the alveolar tissue.

I have met many men, some of whom were physicians, having bad pyorrhea, who received local treatment without much benefit, and usually lost several teeth by extraction. Some of these patients had the pyorrhea subside of its own accord, knowing no reason, and being unable to explain the change that took place. One physician tells me that during the summer, when he lives much of the time at his country seat, where he works outdoors and lives the simple life, his mouth and gums are entirely comfortable, but when in town during the busy winter months, especially towards spring, he has been obliged to have treatment for this trouble.

Etiology.—Many theories have been advanced as to the cause of the breakdown and absorption of the alveolar process and gums around the teeth, and almost all have been found inadequate and untenable when scientifically examined.

A strong ray of light is at present illuminating this subject, and Dr. Talbot is shedding this light.

Dr. Talbot says that pyorrhea alveolaris is the result of autointoxication due to want of proper elimination, and his exhaustive microscopic researches on the alveoli of man and animals, as well as his pathologic and physiologic investigations, tend to prove his contentions, and I believe they are safe and rational conclusions. At any rate, they are the best we have up to the present time. If we in our practical work follow along these lines, we will in time prove or disprove their correctness.

In the higher evolution of man, with changed environment producing conditions which develop changed physical organisms, the teeth and jaws are probably changed and weakened more than any other part of the body. But even now, when the gum tissues are in good health, their resisting power to infection is enormous. This resisting power to local infection is the natural inheritance from times when the teeth and jaws were put to uses and stress requiring great strength. Such stress, when natural and continuous, develops strength in any physical organ.

The great vascularity of these parts is their strength, but also their weakness: by the rich blood supply they restore and rebuild very quickly, but absorption can also take place in the same pro-

portion, and continual low inflammation in the alveolar process due to increased blood pressure results in arteriosclerosis, the surrounding tissue being osseous, breaks down, and the lymphatic system, which is very active, carries on rapid absorption.

The alveolar process is a transitory tissue, and serves no purpose except to support the teeth. When these are gone the processes are absorbed.

Dr. Talbot says: "The alveolar process is an end-organ. The tooth, so far as the process is concerned, is a foreign body. The arteries, capillaries and nerves pass through the bony process and stop. There are other end-organs in the body, chief of which are the kidneys, the eye and the brain. A marked difference exists between the kidney, eye and brain as end-organs and the alveolar process as an end-organ. The difference is the important point in the study of interstitial gingivitis. End-arteries running into the kidney, eye and brain, owing to their soft nature, give the arterial walls a chance at expansion, permitting in a measure the blood to flow more easily, and prolonging the tendency to disease. On the other hand, blood vessels extending throughout the alveolar process in a tortuous manner cannot expand, as the result of which blood charged with toxins and subject to cardiac vascular changes immediately sets up irritation and inflammation resulting in dilation, bone absorption and arterial degeneration. These changes, therefore, will occur much earlier in the alveolar process than in other end-organs."

Disregarding all forms of systemic disease, such as nephritis, rheumatism, gout, diabetes, etc., in their active manifestations, we will consider the milder forms of constitutional disturbances which represent defective metabolic processes, the diagnosis of which is more obscure, especially the explanation of the causes of lowered functional power of the organs. Nervous stress, and shock, change of climate, monotonous sedentary life, together with unwholesome modes of living, may be mentioned as reducing the effective operations of organic functions, which result in faulty metabolism and autointoxication.

A blood smear under the microscope, and the examination of the urine, are methods by which the conditions of the general system may be ascertained.

Dr. Talbot has made extensive examinations along this line on patients having pyorrhea, and I quote his summing up:

"Critical examination of the tables must convince a careful observer that in every examination two conditions are present: First, autointoxication and faulty elimination as represented by the indican; second, kidney overstrain and renal insufficiency. When the liver fails to destroy the poisonous materials, and the bowels to eliminate the toxins, overstrain of the kidneys causes the blood to become overcharged with toxins and acidity, and the heart and arteries undergo degenerative changes. Cardiovascular disease with insufficient blood supply result."

When any of the organs which contribute to the digestive economy are deranged, as, for instance, the stomach, liver or pancreas, the elements taken in as proteids, carbohydrates and fats, are not converted into chyle in an absorbable form or state, but remain in the intestines and are attacked by the microorganisms normally present, which organisms proliferate rapidly to cope with the large amount of undigested food, and in their activities produce the products of putrefaction, some of which are always absorbed by the intestines, and entering the circulation, can be found in the urine as indican. A test showing a considerable amount of indican in the urine signifies to a certainty the presence of the indoxyl sulphuric acid group of intestinal intoxicants, such as indol, skatol, cresol and paracresol. These are modified, and their toxic effect greatly reduced, by being carried in the blood to the liver, which is the aseptic protector of the body, and through this hepatic action they appear in the urine as indican. In general all forms of gastro-intestinal disturbances, aside from their physical signs and symptoms, almost immediately cast their reflections upon that mirror of the alimentary tract, the mouth.

It has long been taught that the presence of indican denotes the breakdown of living proteid, as in the formation of abscesses, in cancerous growths which are ulcerating, etc.

Those who have studied this subject carefully say that where tissues are breaking down and pus is forming, indican will result. Indican is present in 80 per cent of abscess cases treated in dispensaries. But examination of the urine after the pus had disappeared has shown indican still present.

The conclusion, therefore, must be that the abscesses resulted from some abnormal condition, which produced indican, thus lowering the tissue vitality to a point when the abscesses developed. Cases of abundant pus due to extensive infective wounds did not show indican with any regularity, whereas in carbuncles, or abscesses, which seemed to develop without any exciting cause more potent than the resident bacteria of the skin, indican was present in the above percentage of cases.

Pyorrhea seems to come under the same class, and the indican is found in such cases almost uniformly.

The deduction is that indican is the product of putrefaction in the intestinal canal, due probably to the bacillus coli communis acting on peptones. Whether it is deleterious to the system is not known. Either it is, or the process which produces it is injurious. Blood pressure is raised during marked indicanuria. The first sign of renal failure is the raised blood pressure, due to retained excrementitious matter in the blood. Indicanuria seems to be one of the main causes of chronic interstitial nephritis, in which disease the blood pressure for years is nearly doubled.

Indican is indoxyl potassium sulphate. It is changed into this from indol in the liver, being there combined with the ethereal sulphates.

Some of the things causing indican are:

1. Improper mastication, resulting in gastrics, lessened HCl.
2. Gastritis, lessened HCl. HCl stimulates pancreatic secretions, and in such cases delayed digestion carries the peptones too far down the tract to be absorbed, and the coli-communis changes it to indol, skatol, etc.
3. Too much sugar may cause it, due to catarrh following fermentation, and accompanied by much mucus and, therefore, digestion is delayed by: (*a*) Poor juices; (*b*) mechanical obstruction caused by presence of too much mucus.
4. Excess proteid with normal digestion, or
5. Normal proteid, normal digestion, but absorption delayed.
6. Lack of bile, favoring putrefaction, as bile is strongly antiseptic.
7. Weak muscular action of intestines.
8. Food rich in indol, etc.

I believe the process which produces the indican does the

damage, as many samples of urine show modifications of the indican. Might it not be rational to believe, then, that in the intestinal tract lies the cause of pyorrhea, and that indican is a sign of abnormal intestinal conditions, and that it is useless to try to cure pyorrhea permanently while indican is present?

Dental operations, such as orthodontia, wedging, contour, gold restorations, extensive crown and bridge work should be delayed till the urine is normal, for infection seems easy in cases where indican is present.

The symptoms of intestinal intoxication are commonly summed up in the word biliousness, with its lassitude, headache, irritability, nervous depression, muscular stiffness and soreness, cutaneous affections, heavily coated tongue, acid reaction of the fluids of the mouth, together with viscidity, foul breath, sores on the gums and teeth, and pale buccal mucous membrane, a state the patient may be expressing when he says, "I feel wretchedly."

Aside from poisons developed in the intestinal tract by the over-activity of the normal bacteria, abnormally numerous, it should be borne in mind that the intestinal tract is an excretory organ. If part of the dog's intestine, say, six inches, is entirely emptied and amputated from the rest of the gut, the ends of which are then united, this short piece not being severed from its mesentery, and its ends closed, will after three days be filled with excretions. The peristaltic movement of some intestines is so weakened that no complete evacuation ever takes place, and in consequence the alimentary lining is coated with slimy mucus, forming mechanical obstruction by clogging the delicate vessels and glands so abundantly supplied to this membrane.

Much food is eaten which is contaminated, especially meats and fish.

Chemicals used in the preservation of meats, milks, etc., are deleterious to the health.

The United States Government conducts in connection with the Bureau of Chemistry, under the supervision of Dr. H. W. Wiley, food experiments, and different chemicals used as preservatives have been tested on a number of men, with unvarying bad results. These substances have no smell or taste, and the men did not know they were taking them.

In his official report, Dr. Wiley sums up as follows: "It ap-

pears, therefore, that both boric acid and borax, when continuously administered in small doses for a long period, or when given in large quantities for a short period, creates disturbances of the appetite, of digestion, and of the health."

That the gums and other tissues would become affected through a prolonged diet containing such mild poisons there is no doubt, and it would be interesting to make some experiments along this line, or communicate with Dr. Wiley, or someone who would do so in conjunction with other investigations.

When the body is in this state of health, and if not changed by a fever or hygenic and medical interference, more serious conditions usually develop, such as gout, rheumatism, arteriosclerosis, nephritis, diabetes, nervous disturbances, etc.

The alveolar tissues are usually affected long before these organic and constitutional maladies appear, and often pyorrhea is well advanced, with loose teeth and absorbed alveolar process.

The nervous equilibrium plays an important part in the functional activity of the vital organs, and this phase of the etiology of faulty metabolism offers a profitable field for study and special investigation.

Local Aspect and Treatment.—The local operative work of pyorrhea alveolaris requires the highest order of mechanical skill, for the teeth and other parts surrounding them must be so treated as to be entirely free from all foreign deposits, and conditions of an abnormal and pathologic nature.

In this respect the mouth and its tissues do not differ from any other part of the body, and the principles governing asepsis, as applied in general surgery, should be applied to all surgical work on the alveolar tissues. If aseptic precautions are neglected, the best results cannot be expected, aside from the danger of specific infection. A paper on this subject has been prepared for you by Dr. Curtis, of New York.

The local treatment may be broadly divided into two divisions: instrumentation and medication. The first is the technical, surgical operative work, while medication is aimed to render the parts to be operated on aseptic before and during the operations, and to stimulate the formation of new and healthy granulations,

and to protect these newly formed tissues from micro-organic destruction.

It might be well to consider the local manifestations, although these are familiar to all of you, but it will help in making the subsequent discussion clear.

The soft tissues are either greatly hypertrophied, dark and red in color, loose and puffy, or they are pale, anemic and tightly drawn around the teeth, and receded from the crown. An instrument can be passed between the tooth and gum, showing that the pericemental attachment is also greatly destroyed. The margin of the pericemental membrane has thus changed, receding irregularly according to the severity and duration of the disease, and the resistance power of the local tissues.

On the teeth and roots are usually found concretions and deposits. The gray and greenish concretions are always hard, and sometimes very rough, and firmly attached, and often, in multi-rooted teeth, covering the entire surface of one of the roots. This root should be amputated. Again these deposits are so thin and smooth that they are detected with difficulty. It has been found that in some cases of pyorrhea the concretions are deposited in rings and steps. An explanation of this is as follows: The micro-organisms become sterile, or they are arrested in their activities. The vital resistance of the tissues has increased, and thus overcome them, or that they perish in an excess of their own waste products. A renewed infection then takes place, forming a new ring of deposit.

In the most vicious and aggravated cases of pyorrhea alveolaris no deposits are visible, and they are often discernible only to the most educated finger touch. When such teeth are extracted and their surfaces examined under the microscope deposits of a whitish color will invariably be found close to the edge of the membrane. These deposits are believed to be bacterial deposits. The apex of the tooth may be so covered, and the only membranous attachment is on one side of the tooth.

Teeth affected with pyorrhea are usually vital teeth, free from active decay, hard and dense, invariably showing evidences of hypercalcification. Possibly from prolonged external irritation of the dental fibers, running through the canaliculi, the functional

activity of the pulp has been overstimulated, and the odontoblasts have overdone their work.

The root, or part of it, often has a translucent appearance. It is not known whether or not this hardening interferes with the physiology of the pericemental membrane.

These tissues are also disturbed and irritated by imperfect crown and bridge work, fillings with rough and protruding margins, improper knuckling of the teeth, plates carrying artificial teeth, ruthless use of wedges and clamps, etc.

Understanding the anatomy and physiology of these parts, the technique of removing and destroying all elements producing inflammation and infection becomes simpler, and the results more certain, and the possibility of doing mechanical damage to the parts operated upon quite remote.

I am to operate before you at two clinics, and I will then demonstrate in detail my technique, and show you a few instruments which I have designed, and which have cutting and planing edges somewhat different from other instruments now in use.

Before operating I sometimes use the following local anesthetic, which I have found valuable when there is considerable sensitiveness of the gingival tissues. When freshly put up it is efficient and harmless. It should be used hypodermically with fine needle.

℞ Eucain Beta .....ʒss.
Sodii chloridi .....gr. x.
Liquoris phenolis .....m. x.
Fluid extracti hamamelidis, ...f ʒij.
Aquæ dest. .....q.s. ad. f ʒiv-M
Sig.—As directed.

In the local diagnosis of pyorrhea, discrimination must be exercised, and a careful examination of the teeth will usually reveal alveolar abscesses, suppurating pulps, elongation of the teeth producing abnormal occlusion, exfoliated roots and hypersensitive pulps, often inflamed to the point of strangulation.

The X-ray is of great value in such examinations.

Among the agents that I especially like in the medication of the tissues I wish to mention only a few, because when instrumentation is thorough, most of the germicides in use will prove

quite adequate. This prescription is potent and pleasant as a general mouth wash and as a massage lotion:

℞ Menthol .....gr. iv.
Thymol .....gr. v.
Olei menthæ piperitæ .....
Formalini (Schering) .....a a f ℥j
Glycerini .....℥j
Spiritus rectificati .....f ℥ijss.
Sodii bicarbonatis..... (5% sol.) q.s. ad. f ℥vi-M.
Sig.—As directed.

Potassium hydrate is a most effective remedy in that it is a powerful germicide, as well as an antibromic and a mild, painless caustic. This is of great value, as it destroys the false membrane, which has dipped from the mucous lining of the mouth into the pocket or space formed between the roots and gum tissue. This false membrane should be scraped or burned away, as it is always exuding or weeping, and prevents firm and tight closing of the gum around the root.

In pus pockets, after scaling and aseptic irrigation, I use a 15 per cent solution of colargolum or argyrol both being metallic albuminates of silver and specifics against pus, and tincture of iodin and tincture of aconite as counter-irritants and stimulants of granulations and lymphatic activity.

Hydrogen dioxid, borine, glyco-thymolin, etc., are used with good results as mouth washes, and lactic acid, sulphuric acid, trichloracetic acid, zinc chlorid, etc., are used as caustics, solvents, and stimulants.

As an aid in overcoming the adhesion of hard deposits to the root surface, I use a 10 per cent solution of zinc iodid.

To sum up, the local treatment is nothing more or less than thorough antiseptic and aseptic interference, and to bring this about it is necessary to curette, scale, and polish these parts, and apply germicides in such a manner as to eradicate all infection and infectious matter. At the clinics I will show you my instruments for applying massage in pyorrhea. This is vibratory massage, together with aseptic inunction. By this aid I have been able to quickly eradicate infection from the gums and render them hard and firm.

Whether the local treatment of pyorrhea is of as much im-

portance, from certain viewpoints, as some claim or not, matters very little. From the viewpoint of cleanliness and hygiene, prophylaxis of the oral cavity is of fundamental importance.

The tooth brush is a modest agent, but also a powerful one, and may be used with greatest efficiency when properly applied. At the clinic I will demonstrate how it should be used. Not one patient in a thousand knows how, and some seem unable to learn. I will also demonstrate how finger massage should be applied to local parts in the mouth.

Prophylaxis treatment, as applied in general practice, I believe, is responsible for much pericemental infection, and subsequent pyorrheal conditions. Asepsis is not carried out, and all deposits are not removed. The continuity of the protective gingival tissue is broken by wounding, and the infectious matter is stirred up rather than removed. This infection and irritation bring about the inflammation which we are trying to avoid.

Ideal prophylaxis is to render the parts absolutely clean, and to take such antiseptic precaution as to prevent all infection.

Pyorrhea, with its daily and continuous flow of pus through the alimentary canal, invariably means derangement of the functions of the stomach, liver and intestines, besides a continual absorption of toxins. I know of cases where this poisoning has been so severe as to produce pernicious anemia. Thus it is seen that the system has to cope with many poisons, namely, pus exudations from pyogenic pockets in the mouth, toxins resulting from the over-activity of micro-organisms, especially in the intestinal tract, from retention of by-products produced in the process of cell metabolism, from tainted meats and sea foods, and from chemicals in adulterated foods.

Pyorrhea is so prevalent to-day that I invariably find that the most important thing to attend to for new patients, past twenty-five years of age, is to eradicate effete matter accumulated under the gum margins, and to improve the circulation of these parts.

Having given many clinics, and had opportunity to examine the mouths of confreres, I have found that a very large percentage had pyorrhea. I do not believe it can be gainsaid that this malady causes the loss of more teeth, is more baneful to the general health, and causes more discomfort and suffering than any other pathologic process occurring in the oral cavity. In view of

this fact, surgeons should give as much care to making the mouth as clean before surgical operations and during convalescence as is given to sweetening up the gastro-intestinal tract. Except in emergency cases, every patient anticipating surgical interference and anesthesia should have their mouths and teeth put in healthy condition. This supplies to the protection of the system from toxic effects due to unclean mouths, as well as to the protection of the dental organs from destructive influences, to which they are very susceptible during a period of physical depression.

Constitutional Treatment.—The constitutional treatment consists in the removal of the effete products from the intestinal tract, a change and regulation of the diet and of habits, as well as rules of exercise and hygiene to be observed; the nervous system of those who are sluggish must be normally stimulated, thus spurring on the flagging vitality. Therapeutic measures such as may be necessary to make each organ act normally ought to be prescribed.

Every surgeon of to-day before subjecting a patient to any serious surgical operation has the patient's intestinal tract thoroughly cleansed by catharsis and enemeta, etc., and if pyorrhea exists, I say, have it cured, too, otherwise the preparation in advance of operation is but half done and results of a brilliant operation may be dimmed by slow convalescence caused entirely by toxic absorption from pus.

The surgical work performed on the alveolar tissues does not compare with the surgery of the major kind in its effect on the constitution, but considering the etiology and the difficulty of attaining successful and permanent physiologic results, the utmost care should be exercised in carrying out in detail every precaution and utilizing every aid in overcoming this diseased state of the alveolar tissues.

In the carrying out of the constitutional treatment the assistance of a medical specialist, or at least the family physician, is necessary to attain the best results as they make more of a special study of this branch of the work, and are always ready to co-operate and assist. To him should be left the urine analysis and all corrective procedure.

The food problem in this connection is one of the greatest importance, both as to what to eat and the amount of it, in order to bring about a proper balance in nutrition. The proteids, whose

main purpose is to furnish the elements of nutrition to the protoplasmic cell, may be divided into nitrates for muscular and phosphates for nerve and brain tissue. The carbohydrates and fats are consumed by oxidation, giving energy and heat. Some waste matter is necessary to give bulk and to mechanically cleanse or scrub the lining of the digestive apparatus.

To consider the food problem in detail is entirely outside this paper, but I recommend those who wish to study this subject to obtain a copy of Prof. Chittendens' book, "Physiological Economy in Nutrition," in which he admonishes the necessity of intelligently regulating the diet. He instituted dietic experiments carried on with great care upon groups of men of different vocations. The proteid foods of these men were reduced about one-half of the usual amount consumed, and the carbohydrates 25 per cent, and all improved in health, with greater capacity for work and greater resistance to fatigue. The athletes in training gained muscular power and endurance, and boils and indigestion so common in athletic training were unknown.

In closing, I wish to make a suggestion and a plea. Let every dentist make tabulated records of every case of pyorrhea treated, and preserve these for future anaylsis and reference. By this method many interesting and valuable facts regarding treatment and results will be attained, as well as a more careful and scientific procedure in the handling of this disease.—*Dominion Dental Journal.*

PUS FORMATION. By J. J. McKenzie, B.A., M.B. In undertaking to address you upon the subject of "Pus Formation" from the standpoint of general pathology and bacteriology, I am aware that I have undertaken a very serious task, in that it will be necessary to compress into the limits of a short paper, a discussion of many of the fundamental phenomena of pathology.

In the study of inflammation and its results and in the interpretation of inflammatory phenomena, our standpoint has been very materially changed since the days of Virchow and Cohnheim. The viewpoint has been wonderfully broadened, the significance of the process is better understood and unity of interpretation has been the result.

This change has been largely the result of experimental bac-

teriology, and, although there are many phenomena which remain as yet unexplained, especially in the field of such chronic inflammatory affections as pyorrhea alveolaris, yet day by day we are gaining clearer insight, and the result in the end will be a more practical and scientific method of treatment.

It is not necessary here to remind you of the old and limited view of inflammation, which required that there should be present the four cardinal phenomena of *rubor, calor, dolor, tumor.* We have long passed the stage of knowledge where such a view would suffice.

Adami, in his article upon inflammation in Allbutt's *System of Medicine,* after discussing the difficulties of definition, quotes Burdon Sanderson's definition as "The process of inflammation is the succession of changes which occur in a living tissue when it is injured, provided the injury is not of such degree as at once to destroy its structure and vitality." He suggests that this includes too much, and instances the hemorrhage in the liver when it is injured, but it seems to me if one reads into the definition the view of vital cellular reaction, it approaches very closely to an ideal one. Adami himself postpones his definition to the close of his article, after he has considered all the phenomena at length, and defines it as follows:

"As the series of changes constituting the local manifestations of the attempt at repair of actual or referred injury to a part, or, briefly, as the local attempt at repair of actual or referred injury."

I have not time to-night to enter into the arguments in favor of such a definition, but I would call your attention to the important point, that it recognizes the object of the inflammatory process, and in that it differs materially from the view of pathologists, who would look upon inflammation as something injurious in itself, and would forget that inflammation is at bottom a salutary process, which may or may not be successful in attaining the results desired.

For the dental pathologist such a view of inflammation is of importance, as it includes not only all the classical phenomena of pulpitis, but also the first trace of reaction in the odontoblast layer to the irritation produced by caries.

But although we may recognize the essential inflammatory

phenomena associated with the healing of aseptic wounds, yet in the majority of inflammatory processes, and in the one which we have specially to consider to-night, purulent inflammation, the important cause is the introduction of bacteria into the tissues, and the primary changes which occur in the inflamed area are directed towards the controlling of invading bacteria.

Leaving the discussion of how the bacteria gain entrance into the tissue, let us consider for a moment the classical phenomena of inflammation in the pulp or in any similar tissue. You all remember the description of the classical experiment upon the web of a frog's foot, where the process can be followed under the microscope. You will remember that the first visible reaction is seen in the capillaries and veins of the part, that the vessel dilate (sometimes preceded by a very transient contraction), and the corpuscles, instead of flowing comparatively rapid in the thin axial stream, crowd into the dilated vessels and stagnate there. At the same time the white cells begin to collect in the marginal zone, at first simply sticking to the wall, then beginning to penetrate between the individual and endothelial cells, and gradually, by the process of diapedesis, leaving the capillaries to appear in the tissue spaces about them. This diapedesis is not confined to the white cells, but the reds also appear, although their migration is a passive, not an active one, and with the cellular exudate there is poured out into the tissue spaces a fluid exudate which more or less closely resembles in chemical character the plasma of the blood. The exudate will vary according to the intensity of the damage to the tissues and the resulting reaction upon the part of the vessels and the cellular elements of the blood. But in each case we recognize that the formation of the exudate is rendered possible by the stasis of the blood in the vessels, and this stasis is the result of vaso-dilatation.

Now, let us consider for a short time what are the means of defense of the body against invading bacteria and their toxic products.

A very simple method of limiting the action of bacterial toxins of a mild character would be by dilution and by washing away these products out of the lymph circulation. It is possible that to a certain extent the fluid exudate may do this in the presence of mild irritants. It is probable, however, that in the majority of

infected areas the diluent action of the lymph is not of very great importance, although, as we will see when passive hyperemia is applied to the actual treatment of acute infections, as in Bier's method, this may be very important.

When we, however, study the reaction of the body to bacteria and their products, we see that the formation of the exudate is all-important.

Let us consider for a moment the manner in which bacteria damage the body. We recognize now, as a result of the bacteriological studies of the past years that the damage is done by the toxins of these organisms. These may be of two types, the easily soluble toxins, which are best seen in such infections as diphtheria and tetanus, where the organism manufactures a poison which passes into the circulation, is carried to distant parts, and gives rise there to many of the accompanying phenomena of the infection. The other type is not so readily soluble, is intimately bound up with the bodies of the bacteria, forms, in fact, an integral part of their protoplasm, and is only liberated into the tissues when they disintegrate. These have been called endotoxins to distinguish them from the extra-cellular toxins of the other class.

Now, in regard to the first class, we know that the body is able to manufacture certain anti-bodies, so-called anti-toxins, which neutralize the toxins and then throw them out of action.

In the treatment of diphtheria by its anti-toxin we have a striking example of this. How far the presence of such anti-bodies in the blood plasma and consequently in the fluid exudate is of influence in combating the infections which ordinarily occur in tissues such as the pulp, and which are most frequently due to pyogenic organism is an open question. The facts of bacteriological investigation hardly support the view, for the reason that we do not find these organisms producing the typical extra-cellular toxins which require anti-toxins. This is especially seen in the failure of the anti-streptococci serum to produce well-marked cures in such a streptococci infection as erysipelas, or in septicemia. It would be rash, however, in the present state of our knowledge to deny the presence of some readily soluble toxin in the pyogenic infections against which a suitable anti-toxin would act, and, if that were possible, another important function of the fluid exudate would be found.

Another fact which bacteriological research has taught us is that the blood plasma is in itself inimical to the life of bacteria—that it has bactericidal powers. This is probably not true for all bacteria. Some are much more easily killed by the blood plasma than others, and some do not seem to be affected by it at all. Organisms such as the cholera spirillum and the typhoid bacillus may be readily killed by these substances in the plasma, and this is especially seen in the action of the blood of a person who has passed through one of these diseases. The blood has increased bactericidal powers, and the immunity is due to the condition.

In the case of the pyogenic organisms, on the other hand, this does not seem to be the case, so that for these organisms the bactericidal activity of the exudate may be of no significance, but whether it may not play a part in some of the special infections of the pulp canal is unknown, and it is well to bear it in mind.

The blood plasma contains in solution another large group of bodies called the agglutinins. The effect of these bodies is to cause the bacteria to adhere and form clumps, and the exact significance of this for the phenomena of infection is not at once evident, but it is probable that the agglutinating activity of the plasma prevents the rapid spread of organisms to distant parts, which would be so much easier if they were not caused to clump in larger and smaller masses. In exposing the bacteria to these agglutinins the presence of the fluid exudate must have a salutary influence in limiting the spread of the infection.

There is, finally, in the blood plasma and in the fluid exudate another group of substances which are all-important in the pyogenic infections, but before considering these we must look for a moment at the cellular elements of the exudate, and of these at the white cells.

In observing an inflamed area under the microscope we see these leucocytes first sticking to the capillary walls and then actively migrating into the tissue spaces, and if we study the direction of their migration by appropriate methods, we see that they are definitely moving towards the point of infection.

It has long been recognized that this migration is due to a definite response on the part of the leucocyte to a stimulus. They are actually attracted by the products of the bacteria, and consequently approach the bacteria themselves. We say that they have

chemiotactic irritability, and that the bacteria have a positive chemiotactic action upon the leucocyte.

The reason for this migration is at once seen when we make stained preparations of the cellular exudate from an area of inflammation. We find that the leucocytes have picked up the invading bacteria, and if appropriate methods are used, degeneration of the ingested bacteria can be seen.

It is not surprising that when Metchnikoff first studied this phenomenon that he concluded at once that the leucocytic migration was for the purpose of destroying the bacteria. His explanation was not at first accepted by many pathologists, but to-day it is universally accepted, and the phagocytic activity of the leucocyte is recognized as one of its most important functions.

However, the mere invasion of the infected zone by leucocytes does not in itself mean phagocytosis and destruction of the bacteria. Researches of the past few years have shown that in order that phagocytosis may take place there is another constituent of the blood required, a substance which prepares the bacteria for phagocytosis. The importance of this material may be shown by a simple experiment. If you take a suspension of human leucocytes, which may easily be obtained by a simple piece of technique; wash them free from blood plasma and mix them with a suspension of a pyogenic organism; then maintain the mixture at blood heat for fifteen or twenty minutes, and from this prepare microscopic specimens, you will find that the leucocytes have not picked up a single organism; they have remained inactive alongside the bacteria, although an examination of them upon the warm stage of the microscope will show that they are all living.

If, on the other hand, we mix a small quantity of blood serum with the suspensions of leucocytes and bacteria, or if we treat the bacteria first with blood serum before mixing them with the leucocytes, and then place them together at blood heat for fifteen minutes, we find in the microscopic preparations that every leucocyte has engulfed large numbers of bacteria; in fact, I have seen leucocytes under favorable conditions pick up as many as fifty or a hundred bacteria in fifteen minutes' time, so that their protoplasm was packed full of the organisms. It will be seen from this experiment that there is something in the blood serum, and we can show that it is also in the plasma, which, acting on

the bacteria, so changes them that phagocytosis may take place. To these substances Sir A. E. Wright, who first studied them, has given the name of opsonin. Exactly how they act we do not know, but their presence is necessary to phagocytosis, and the persistence of many types of chronic purulent inflammations, as, for instance, boils, pimples, pyorrhea, is apparently chiefly due to diminished opsonic power of the blood.

We thus see that when, as a result of the hyperemia, which ushers in the inflammatory process, an exudate, consisting of fluid and cells, passes into the tissue spaces, it brings with it all these various instruments which nature uses to fight infection. The pouring out of the exudate is definitely for that purpose.

The character of the exudate varies much in different types of inflammation, so that we may speak of it as serous where the cellular elements are few and the fluid portion is poor in coagulable material. When the cellular elements become more prominent we may speak of it as sero-purulent or fibrino-purulent if coagulable material is a marked feature, or, if the cellular elements predominate, we may use the simple term purulent. The varying character of the exudate doubtless is determined to a large extent by the character of the infecting organism, but it is partly determined also by the reactive ability of the infected individual.

In the case of certain bacteria, however, the tendency is generally for the inflammatory exudate to assume a purulent character, and in consequence we speak of such organisms as pyogenic or pus-producing, and in pus production we simply have the collection of enormous numbers of polyneuclear leucocytes, which, on account of their chemiotactic irritability, have been attracted to the point of infection. The pus cell is, in fact, a leucocyte, and it is a mistake to speak of it as a dead leucocyte. Probably fifty per cent of the leucocytes in a collection of pus are still living, and only so long as they are living and active can they carry on phagocytosis, although we must not assume that when the leucocyte dies there are not still important functions performed by the product of its disintegrating protoplasm. Indeed, there is evidence in favor of the view that certain of these protective substances may originate from the leucocyte itself during disintegration.

We must, therefore, look upon that collection of white blood

corpuscles which we call pus as brought there for a very definite purpose, namely, to remove the bacteria. We do not mean, of course, that the leucocytes are advancing to the point of invasion with set purpose, but the chemiotactic irritability makes it imperative that they move to the point where the bacterial endotoxins are being liberated. So strong is that attraction that the formation of pus to any extent anywhere in the body is indicated by an increase of the white cells of the circulating blood, so that their number increases from 7,000 to 8,000 per c.m.m. rapidly to 10,000, 12,000, 15,000, 20,000 or even more. In fact to-day one of the most important means we have of recognizing the presence of a purulent infection anywhere is by this so-called leucocytosis.

If these, then, are the objects of the cellular and fluid exudates, it must naturally occur to one at once to ask, why are they not always successful? It is a common observation in surgery to find pus formation becoming chronic, abscesses do not always proceed rapidly to healing, and many purulent infections of the skin and of the mucous membranes show a special tendency to become chronic. In the skin, pustular acne or furunculosis are good examples; in the mouth, the omnipresent pyorrhea alveolaris.

In the skin affections above referred to, A. E. Wright and his associates have conclusively shown that these individuals are lacking in opsonins. As he expresses it, their opsonic index is low. They have not so much as normal individuals, and the treatment introduced by Wright conclusively shows that these infections, in the majority of cases, can be cured by raising the opsonic index, *i.e.*, stimulating the production of opsonins by inoculation. The blood flowing to the point is then higher in opsonins than normally, and more necessarily combine with the bacteria, and consequently phagocytosis becomes more active.

There is no doubt, also, that the mechanical condition obtaining about a collection of pus must of necessity affect the opsonic activity, or rather the possibility of exposure of bacteria to opsonins. Where the infection is closed about by dense connective tissue, the mere mechanical collection of the exudate must limit the amount of opsonin coming in contact with the bacteria. The fluid exudate at first, but especially the leucocytes crowding into the focus, must more and more compress the vessels which are carrying the blood to the point, and as a result, if the first rush

of exudate does not clear away the invader, the exudate itself hinders its salutary action; it gets in its own way; a pressure anemia results, death to the leucocytes and of the tissue elements about them rapidly occurs, and the bacteria, instead of being endangered, are walled about by a mass of necrotic tissue. One of my own pupils showed quite conclusively that fibrin tended to filter out and remove opsonin from the blood serum, and it is well known in regard to other protective substances in the blood that they are quickly absorbed by dead tissue. Consequently the tension within the abscess is frequently a very important reason for its not being absorbed. As a matter of fact the leucocytes keep crowding in, possibly coming from more and more distant capillaries, and the pressure and anemia gradually leads to a solution of the tissue holding it in, and the abscess bursts. To evacuate pus wherever found is one of the old axioms of medicine, and to-day we know that the importance of this is in the fact that the tension removed, the blood returns with threefold energy to the abscess wall, the fluid part of the exudate reappears, and the bacteria are destroyed.

But, you may very well object, this does not always happen, one boil is followed by another, and so on. It perhaps is not altogether clear why this is so. In a large number of cases inoculation treatment so increased the opsonic index that the infection stops, but in some people this treatment is not successful, or, if successful for a time, they tend to go back. It is difficult to keep the opsonic index up. It is possible that many of these cases are suffering from some form of autointoxication, which lowers all the resisting powers of the body, and, at any rate, many of these cases get well under general treatment, such as tonics, diet, change of air, etc. It is possible also that there may be some chemical fault in the blood which prevents the formation of proper exudate.

A puzzling type of chronic infection which I am sure you are all thinking about is pyorrhea alveolaris. Here we have a purulent inflammation, perhaps the most typically chronic of any in the body. I am inclined to think that the majority of dentists view this as a constitutional disease, and, at any rate, use constitutional remedies to assist them in their struggle against it. But I think you will find, when you look into the history of our

knowledge of any of the more chronic infections, that this explanation of constitutional weakness has been the more often used the less we knew. It is practically a confession of ignorance to say that pyorrhea is constitutional, and this in spite of the fact that constitutional remedies may assist in the fight against it.

If one makes a microscopic preparation of pyorrheal pus. one sees, of course, enormous numbers of bacteria of all kinds, and one sees large numbers of pus cells, but one is struck at once by the fact that there is no phagocytosis. The bacteria are all outside the leucocytes, and this is not because the leucocytes are dead—one can demonstrate on the warm stage of the microscope that some are still living. We know now, as I have shown, that if phagocysosis does not take place when leucocytes and bacteria are brought together, it must be due to the absence of opsonins, so that we must conclude that there is no opsonin present in the pyorrhea exudate. Why is this? There is no question of tension here. The possible absorption by the necrotic walls of the pocket may play a part, but I have thought recently that there may be another factor for which, however, I have no positive proof. We know as the result of work upon the coagulation of the blood that calcium salts are necessary; that, in fact, the blood coagulates the more rapidly the more lime is present. Now, Wright has demonstrated that under certain conditions of high calcium content of one blood plasma, the blood clots so quickly when it is poured from the vessel that a dry fibrin rather than a fluid exudate forms; as a result the infection is not cleared out. In certain cases he has treated such a condition successfully by the administration of citric acid, which in some way lowers the calcium content and certainly slows markedly the coagulation. He claims that in these cases the exudate immediately became more fluid and the infected wound healed up.

We have no observation upon the coagulability of the blood in pyorrhea, but from the prevalence of the disease we are not likely to find that the amount of calcium in the flowing blood would have much influence, but when one realizes that in the pockets about the teeth what always is present are abnormal deposits of calcium salts, it may be that this plays an important part in preventing the escape of a sufficient amount of the fluid

part of the exudate which contained opsonin to bring about a healing of the abscess.

However, in whatever way we approach the question of the treatment of purulent inflammation, we see that that treatment is successful in so far as we assist the natural forces of the blood to combat the infection. A very striking example of that is seen in a method of treatment of tuberculosis and acute infections which was introduced by Bier of Bonn and which is described in detail by him in his book, "Hyperæmie als Heilmittel." In Bier's method he produces a tremendous passive congestion by bandaging a limb high up above the infected spot, so tightly as to cut off the return of blood through the veins, whilst permitting the blood to flow through the arteries. As a result an extreme edema of the part below the bandage is brought about. This is maintained sometimes for many hours; then the bandage is removed, and the fluid exudate is permitted to drain back into the body. This may be repeated a number of times; but one is struck with the remarkable results which are reported from this treatment, especially in acute infections. When one considers Bier's treatment from the standpoint of the protective substances of the blood one sees at once that it is eminently rational, in that it insures a flooding of the infected area with all these substances.

In conclusion, I think that we may say that only those methods will be successful which conserve and assist nature, and nature's method is to bring to the seat of infection a blood rich in the natural protective substances so as to form an exudate properly fitted to combat the invading organisms.—*Dominion Dental Journal.*

ANESTHETICS. By William Taylor Barry, M.D. Dentistry is really a department of medicine and so broad and comprehensive a department have your labors and researches made it that it touches not only surgery but also general medicine, so that we, the doctors of medicine, yield to you gentlemen most willingly your well-earned and deserved titles of doctors or dental surgeons.

I am thankful to see that the two professions of medicine and dentistry are yearly drawing nearer together, and I venture the

pleasant prophecy that the County Medical and Dental Society will ultimately become in a measure affiliated.

My intention this evening is to glance rapidly at that profound and still mysterious subject of anesthetics, so necessary to the practice of medicine, so important in dentistry. We all know Morton's honored place in this connection.

First let us look at the question of anesthetics from a business standpoint, for strange to say, practical business is continually interfering with the proper development and practice of the science of anesthesia, and in this way:

The physician or dentist desiring to use an anesthetic for an operation or extraction of a tooth, feels the need of a skilled assistant, someone to give the anesthetic while he operates. This frequently causes an awkward pause. He must look up another practitioner, or he must call in a physician. This consumes time, causes delay and increases the expense. The patient is willing to pay a dollar, it may be, for an extraction, but will he pay two dollars or five dollars for an anesthetizer? To escape all this trouble the dentist or physician gives the anesthetic himself, makes it as short as possible, and frequently hurries through the operation in a way unsatisfactory to himself, while at the same time there arises before him the nightmare of the patient suddenly displaying some unlooked for idiosyncrasy and dying in the chair, a sorrow, alas, which both medical men and dentists have been called upon to face. And all this is brought about by the force of practical business, which so often ties him and denies the helping hand of someone to assist in the operation and to share the responsibility.

Now gentlemen, you owe it to yourselves, to your profession, and to your patient to lift anesthetics out of this slough of despond, and people *must* understand that a difficult extraction requiring an anesthetic must be paid for in proportion to the skill and time and responsibility required by the dental surgeon. It should not be a question of one dollar but of five or ten dollars, if in your judgment the case merits it. Time is all the capital that a professional man has, and to rob him is to rob him and his dependent ones of their living and their property,—of their all.

And now, with your permission, I will take up briefly and rapidly the subject of anesthetics. The first principle to lay down

is that there is no such thing as a perfectly safe and harmless anesthetic. In their power lies their efficacy, and also their danger. "They heal and they destroy; they kill and they make alive." Consequently no anesthetic should be given without proper caution and preparation. To the dentist I should especially recommend that the patient be first placed for a few moments in the Trendelenburg position,—that is, on the back on a plane incline of 45 degrees, the legs and feet hanging over the end of the table. The object of this position is, as is well known, to relieve the heart and flush the medulla oblongata with blood, the great nerves supplying the heart and lungs having their origin in the medulla or at the base of the brain. So that you commence your anesthetic with that vital spot well and richly nourished with warm oxygenated blood and with the heart temporarily eased and rested. If things go wrong you will have to resort to the Trendelenburg position at last, and this precaution may obviate such a necessity. I am informed that all modern dental chairs may be tipped back to an angle of 45 degrees. In all events, the patient should be allowed to rest a few moments on a sofa before beginning the anesthetic. The heart should be examined, and I recommend all dentists' offices to be equipped with a Bowles stethoscope. If the pulse is over 80 and below 60 the anesthetic had better be delayed until normal conditions are restored, or the existence of a harmless idiosyncrasy established. The habits and peculiarities of a person should at least in a measure be understood.

I appreciate and sympathize deeply with the dentist, who to save pain is bound to risk in a higher or smaller degree the life of a patient or bring reproach to himself by an unhappy termination of something so simple as an extraction. The dental anesthesia is usually for a short operation, and is therefore in usual contrast to that used by surgeons. The full stage of complete anesthesia is seldom aimed at; hence the surrounding of a dental operation with so many more minute precautions, and even though the anesthetic be given in the prone or sitting position, and I recommend the prone, the patient must almost invariably be raised to the sitting posture before the operation commences. Hence, theoretically, it would seem to matter little so far as the safety of the heart is concerned whether the increased task be thrown on

that organ by beginning or ending with a sitting posture. There is perhaps room for discussion here.

Chloroform.—It has often seemed to me that science has as yet given us but one certain anesthetic, one that will absolutely, upon all persons and under all conditions, produce anesthesia, and that drug is the vapor of chloroform. It also possesses the great boon of being neither explosive nor inflammable, and a few drachms are sufficient for even major operations. But it has elements of danger so serious that it must always be in expert hands; but when well handled we can safely say that it seldom kills, and almost never causes serious after effects. Its power for certainty and rapidity of action makes it the ideal anesthetic for the dental chair, while the suddenness with which death may come from its inhalation makes the wise dentist and physician always hesitate. Still, it is the king of anesthetics, and continues to hold its mighty sceptre in the kingdom of anesthesia after an undisputed reign of over half a century.

There is really but one way to give this remarkable anesthetic, that is, with the admixture of plenty of atmospheric air, and by the drop, and Esmarch's open mask is the simple and ideal method.

In the use of an anesthetic, important things to watch are the pupils, the heart, the respiration, and the pallor of the face and cyanosed condition of the lips.

Chloroform, and practically all general anesthetics, have three great and important stages to remember.

In the first of these the symptoms are similar to those of alcoholic intoxication. This stage is generally very short, but in athletic persons, and especially in those who have been intemperate, it may be long and very violent. It may persist after loss of consciousness. In drunkards this excitement at times cannot be overcome without great danger to the life. During this first stage, although consciousness is not lost, the sensibility is generally blunted, but very rarely is it altogether annulled. Dr. Coleman states, however, that he has extracted his own teeth without pain, and Dr. Snow relates the anecdote of a child who played with his toys during the operation for lithotomy.

During the second stage, which is that of anesthesia, consciousness and sensibility are abolished, the muscles are relaxed, and the patient lies perfectly quiet. This is the surgical stage, during

which ordinary operations are performed. As already intimated, in some cases the first and second stages are united, so that violent excitement, muscular spasms and rigidity may exist with loss of consciousness and of sensibility.

The third stage is one of perfect narcosis, with stertorous breathing, intense muscular relaxation, and abolition of ordinary reflex action. This is always a condition of danger, and its induction, except under very peculiar circumstances, by chloroform or other anesthetic, is absolutely unjustifiable.

The above fine description of the three stages of anesthesia is taken from Dr. Wood's Treatise on Therapeutics.

Therefore, as you will readily see, gentlemen, dentistry deals more especially and solely with the first and second stages. To what extent one can safely operate in the first stage with comfort and safety to the patient, is what I desire to bring before you for discussion, since it is claimed that it is possible for the sudden shock of even an operation as mild as that of extracting a tooth, to send a wave of impulse to the centers sufficient to paralyze the nerve-supplying cardiac action or the respiratory function.

The second stage is of course the ideal one, and for my own part I believe it is quite possible that a skillful anesthetizer can bring about a condition of anesthesia which can be safely used for dental work between the two. In other words, where the first merges into the second.

Ether.—The second great anesthetic is ether, a colorless, volatile liquid. We notice that the first effect of ether when inhaled is to produce a sense of exhilaration and lightness in the head, associated with roaring or buzzing of the ears. Some patients weep, some laugh, some rave and some want to fight. In rare instances the dreams become erotic, an important fact to remember, so that the first effect of ether is really similar to chloroform, and consists of a species of intoxication, though approached in a somewhat different method from the chloroform narcosis, and there is rarely sufficient anesthesia in this state for operation.

The second stage of ether narcosis begins with complete loss of consciousness, muscular rigidity begins to wear away, the breathing becomes somewhat stertorous. The pulse is quickened and increased in force by ether, and will often remain thus dur-

ing a prolonged narcosis—an important thing to remember: that ether, for all practical purposes, acts as a stimulant to the heart.

In the third stage we have as in chloroform a complete loss of consciousness, a great stertor, and if pressed beyond this stage becomes equally dangerous with chloroform.

Ether has many after effects disagreeable in their nature, which renders it unpleasant for a dentist's office, such as great nausea with persistent vomiting, and a great length of time in recovering sufficiently from the vapor or the attending nausea to leave the office.

On the whole, therefore, ether, especially in unskilled hands, may be said to be safer for general anesthesia than chloroform, and with a view of considering this important factor of safety pertaining to administration, should be selected, in spite of the fact that chloroform is quicker, more rapid and certain in action, and without the disagreeable after effects mentioned.

I shall not take up the subject of local anesthetics beyond remarking that in my opinion they should be given with exactly the same circumspection, following much the same precautionary rules, as the general anesthetics.

Some of the Newer Anesthetics.—Regarding some of the newer anesthetics and the old standby laughing gas (nitrous oxid), I shall only dwell upon them sufficiently to remind you of their existence and importance. They lie in a field of research and practical experience that I have scarcely invaded, but I know that there are men present this evening that are skilled in their application and competent to discuss their merits and uses. I refer to the Ethyl group and their various combinations under Somnoform, Narcotile, etc.

I have given, or assisted in giving, these only a few times in my life, and I cannot say that I felt satisfied from appearances that they were either pleasant or perfectly safe. They are usually given with an apparatus, and as a physician I do not like apparatus; but perhaps with more extended experience I should think more favorably of them.

That ethyl bromid and chlorid are both intense poisons and that they may rapidly destroy life is true without discussion. Care and skill must of course modify and minimize the danger attending their use; but, with my present knowledge, I cannot

regard them as being greatly safer than chloroform, and certainly less so than nitrous oxid, though ideal in action for a simple operation like an extraction.

Murphy says, "Just as much skill is required in their use as any other agents, and they can cause death as rapidly and truly, this death being not only asphyxial, similar to that caused by nitrous oxid, but also vaso-motor, similar to that caused by chloroform." Murphy also states that in his opinion the ethyl bromid is safer than the chlorid.

So leaving this brief mention of some of the newer anesthetics to bring out whilesome discussion, I conclude the subject.—*Pacific Dental Gazette.*

A PLEA FOR MORE THOROUGHNESS IN DIAGNOSIS, MORE CONSCIENTIOUS OPERATIVE WORK, AND A CLOSER APPLICATION TO OUR DENTAL LITERATURE. By G. W. Cochran, D.D.S., Erie, Pa. A résumé of 1906 dental literature in our many most excellent journals (of which seven are received monthly by the writer) reminds one of the many varied subjects that have been covered by the respective "authors." We should all feel that we have been greatly endowed with knowledge from great fountainheads.

There are, no doubt, just as good men practicing dentistry today who have never appeared before a society with a paper, or even in print with original contributions. Delving into the depths of science requires time, and many busy practitioners do not feel that they can make this sacrifice. Those who are sufficiently charitable to sacrifice their valuable time with contributions and a desire to enlighten everyone who may read them are entitled to special praise. By all means give us an abundance of original papers in our many magazines.

Just what proportion of dental practitioners subscribe for, carefully read, properly digest and assimilate the many most excellent scientific papers that are being published monthly in our various magazines, is highly problematical.

The writer observes that one of our leading publications claims some seventeen thousand monthly circulation; many dentists, no doubt, subscribe for more than one journal. If the rank and file of dentists would take two or three good dental periodicals

monthly, read and study them as they should be studied in order to properly assimilate what they contain, I venture an assertion that there would be a great awakening of the profession and the public, but more especially among the medical profession. Then, and not till then, will they think we are truly stomatologists.

Judging from clinical experience as cases come under one's observation every calendar month, many dentists (and not a few physicians) are woefully weak in correct diagnosis, or if they have arrived at a correct exposition of their cases, they display a mighty show of indifference as to their ability to eradicate the abnormal conditions for their patients, or else so many people would not be obliged to seek others for relief.

This paper is written in the most friendly spirit, with malice toward none; but in order to make it effective, we purpose to pull the throttle wide open, and assume a rather radical pace throughout its course, so much so, that the writer is fearful the wise Editor will look at it through his "specs" with considerable doubt as to the propriety of giving it space in his valuable magazine.

Getting back to our subject again, we say some dentists (mind you, not all) will treat, and treat, and continue to treat lame teeth and jaw complications, and being unable to cure the afflictions for their patient, would rather see the patient lose the tooth or teeth, than recommend him to someone who can relieve him, and in cases of jaw complications, would apparently prefer to see the unfortunate individual pass into the undertaker's hands rather than honorably acknowledge their inability to properly treat the condition and recommend the afflicted one to a practitioner who might be able to diagnose the case correctly and straightway afford relief.

A Case of False Diagnosis.—A slight digression for amusement's sake. Once upon a time a lady suffered most excruciating reflex odontalgia that took up its abode in the left Gasserian ganglion. She doctored with the family physician for neuralgia for some ten days, and during this ten-day period had been advised to consult her dentist for possible tooth complications. She was told by two different dentists (good ones, too) that her condition was plain neuralgia and would require time to wear off (a heap of consolation to one in such agony and pain). So depressed was she, that she remarked that death would be welcome in preference

to a continuation of the excruciating pain she had endured in close successive paroxysms for more than a week. Her family physician had gone his limit with the use of opiates, and was conscientious enough to frankly acknowledge he was at his wit's end as to what to recommend. He felt that her condition was one that required the services of a nerve specialist, and recommended going to a big town and consulting one. Wise council prevailed and relief was sought for and obtained before trying the nerve specialist. Upon first examination the roots of a first left upper molar (off level with the gum tissue) presented for consideration; also the left upper cuspid contained a large cement plug; pulp had died and this tooth had been tapped to relieve a decomposed pulp; the canal had remained open for some four years, and was nourishing a blind alveolar abscess. Most diagnosticians would have been quite sure this particular tooth's condition was in itself sufficient cause for all the pain and suffering—but not so—pain of the character this patient had endured is very seldom found associated with alveolar abscess. Further search revealed a left lower second bicuspid, which, when the pulp canal was explored, produce a shock that reached the left Gasserian ganglion and made the patient almost frantic for a few minutes. A chloroform compress was immediately placed over the ganglion region and cocain was hurriedly placed in the cavity of the tooth, and in less than ten minutes all pain had disappeared entirely. The pulp was extirpated under pressure anesthesia, being partially dead, due to exposure.

Decomposing pulps in teeth and calcific formations or pulp nodules, are a prolific source of reflex disturbances of the character this patient suffered, *but alveolar abscess never.*

The writer thinks that practitioners who so far forget their professional duty toward their patient, as to plod along and jeopardize the individual's health rather than recommend him to someone who can diagnose and straightway afford relief, are guilty of unprofessional acts far greater in magnitude than many of our other unethical irregularities.

Case 2.—Again the writer has seen alveolar abscess conditions that were treated for a long period and the patient's health gradually and rapidly being undermined with a true alveolar necrosis, the results of a former alveolar abscess, and while this practi-

tioner was unable to effect a cure after some two years' sinus treatment, he was not sufficiently honorable to admit his inability to cure the lesion, but permitted his patient to suffer until she became so depleted she was forced to seek the services of another who did know how to properly diagnose her condition and eradicate the necrosis completely, and thus restore her to good health.

This particular case was a right upper lateral incisor, supporting a Bonwill porcelain crown, which was adjusted by Dr. Bonwill, and had seen seven years' service. The tooth unfortunately developed an alveolar abscess. It had been treated through the sinus for a long time. Eventually the sinus disappeared, but the tooth with the firmly adjusted crown continued lame. Patient's general health became impaired; took on every evidence of a general neurasthenia, a marked debilitated condition, restless nights, loss of mental activities; in fact, her condition was assuming proportions that were causing her intimate friends to fear for the worst.

The alveolar pus sack had thoroughly decomposed and true alveolar necrosis had been in existence for more than a year; the necrosis had extended through into the floor of the nasal chamber, and in this manner was Nature taking care of the drainage, and this accounted for the absence or disappearance of the former sinus. The gradual systemic disturbance was due directly to absorption of pus via the cancellated bone structure; the discharge of pus from necrosis is not so profuse as with softer tissues, but is of a far more virulent character, more on the order of mephitic gas, conceded by chemists to be the most poisonous gas known to chemistry.

Pulp Mummification Condemned.—Many dentists blunder along treating teeth containing considerable calcific deposit or pulp nodules, and in lieu of having sufficient energy to clean out the constricted pulp canals and fill them properly, they would rather content themselves with the lazy and indifferent operator's method and trust to mummifying pastes to maintain quiescence. Now this is all wrong—what are the results of such methods? Simply this, the mummifying paste spends its germicidal properties; in a year or two bacteria commence to propagate, and an alveolar abscess is sure to result unless the tooth is opened for the escape of mephitic gas and pus-micro-organisms through the apical for-

amen. Having opened a few dozen teeth that had been treated with mummifying paste, the writer knows whereof he speaks. With a 20 per cent solution of sulphuric acid, there is precious little excuse for such practice. I dare say, millions of multi-rooted teeth are consigned to the forceps annually, due solely to lack of thoroughness in mastering canal treatment and filling. It requires considerable will-power to work over multi-rooted teeth for three hours (more or less), constricted pulp canals and pulp nodules to contend with, and to find at the terminal end canals of normal size. Operators who are thorough in this particular will surely agree with me on this point at least.

Now the moral of this much-neglected canal treatment is simply this: these unfilled canals in this class of calcified teeth containing pulp nodules, exostosed roots with obtuse and right-angle curves, are bound to cause serious trouble. I say without much fear of contradiction that this class of teeth are the main cause of fully 98 per cent of all the neuralgic and reflex odontalgia disturbances about the jaws and face.

Reflex odontalgia that locates in the Gasserian ganglion disturbs one's equilibrium faster than any pain the writer knows. Why neglect thoroughness in our pulp canal work, when we are cognizant of these proven clinical facts? Unfilled canals in any tooth sooner or later develop alveolar abscess, and no wise practitioner that knows anything at all about the surgical treatment of chronic or incipient alveolar abscess, would think for one minute of scooping out an infected pocket at the apex of a tooth, and not be positive in his own mind as to the exact interior condition of said tooth. If he does attempt surgical procedure upon such teeth his efforts will be rewarded with nothing but a series of failures. Far better is it to remove the old canal fillings unless you are positive of the skill of the previous operator.

Twelve years of clinical experience suggests the following advice: By all means make sure your canals are properly enlarged, so they can be well filled. Keep an accurate record of all canal work; and any canals that you find entirely obliterated in the molar teeth, make special record of. In the future should any tooth develop an alveolar abscess, treat surgically by making a free opening at the infected portion, curette away the pus sack, excise a portion of the root, irrigate with a good antiseptic solu-

tion, pack the pocket with 5 per cent iodoform gauze, maintain daily treatments for two or three weeks, permitting granulation from bottom outward, observing throughout the whole procedure thorough surgical cleanliness, and your tooth will get well.—*Items of Interest.*

THE VITAL SIDE OF THE DENTAL PROBLEM. By Edw. C. Kirk, Philadelphia, Pa. When one studies the definition of the word dentistry as found in the various lexicons one is invariably struck with their lack of comprehensiveness, not one so far as I am aware measuring up to the full meaning of the word "definition," that is to say, a descriptive statement or term which includes everything that a thing is and excludes everything that it is not. All definitions of dentistry by lexicographers have one common feature, viz., they give point and emphasis to the mechanical, the prosthetic or restorative element of our professional work, and many indeed confine their definition of dentistry to that aspect of it. So prominent a position is assigned to the manipulative and mechanically restorative element of dentistry by the majority of its practitioners and teachers that this material phase of it, if we exclude the operation of tooth extraction, has come to be the principal feature by which our professional work is characterized by the general public as well. Whether this attitude of mind correctly represents the work and position of dentistry is the question which I wish to examine with you this evening.

A prominent and well-known teacher of dentistry has recently said, "I want to contend.....that the mechanical training, the technical training of dentistry, has done more to make it a respected and honored profession than all the excursions into the doubtful realm of medicine. We are respected by the medical profession not because we can discuss with them the more abstruse questions of medical science, but because we can do with an exquisite technique the surgical work of our own special field—the mouth."

Let me at the very outset make my position as clear as possible with regard to the "exquisite technique," the mechanical skill and the whole question of mechanics and mechanical achievement both in and out of dentistry. I give place to no man in my admiration, my respect for mechanics in its science and in its applications. I know of no other material demonstrations that show forth so wonderfully

or so perfectly the divinity that doth hedge a man as the creations of his intellect executed by his hands and materialized in the things mechanical which he has done. Nor is my admiration merely on a scholastic basis, for mechanics is my pastime, my recreation and my constant source of pleasure, so that where necessary I stand ever ready to defend mechanics and its devotees in any event which would try to rob them of all that is their due in honor, place or reward. But the question before us is not the intrinsic dignity or value of mechanics in dentistry, but rather what relation does mechanics bear to dentistry. I put the question in that way because from oft-repeated observations recorded in our literature I am constrained to believe that there are many among us who seem to have the opinion that the mechanics of dentistry is dentistry and there is the end of it.

My friend with the "exquisite technique" who objects to "excursions into the doubtful realm of medicine," while he would doubtless resent the suggestion that the whole of dentistry was comprised within the limits of its "exquisite technique" has so stated his case as to lay himself open to the suspicion that he is bordering very closely upon a belief in just that narrow limitation and anyone who is in the habit of observing the trend of dental professional thought must have been impressed with the fact that there are very many, too many indeed, of our professional colleagues whose conception of dentistry is of just about that same magnitude.

The old axiom that what a man believes, that he is, contains more than a grain of truth, for belief tends to create our ideals and to guide and control our actions, hence it is of the utmost importance that our beliefs about dentistry should be correct beliefs, otherwise we do an injustice to our profession by misrepresenting its position and its purposes in relation to the service of humanity, and we hinder and obstruct its progress by diverting its activities into wrong channels of effort.

In the contemplation of the mechanics of dentistry, and in this I include its "exquisite technique," both operative and prosthetic, too many of us have mistaken the means for the end. Broadly speaking, all technical operations in dentistry, from the insertion of a filling to the insertion of a prosthetic fixture, from the local operative treatment of pyorrhea to the correction of malocclusion, have the common purpose of restoring lost or disordered function and to that extent are therapeutic in their essential character, just

as certainly as the administration of digitalis for a weak cardiac action or of quinin for malaria are therapeutic measures. The means are different in each instance, but the objective purpose in all is the same.

Dentistry then is a department of the science and art of healing, and to that end it makes a certain use of mechanics among its therapeutic means.

My mechanical friend has apparently failed to see that it is dentistry that has dignified its mechanics rather than the reverse, and that it has done this because of the vital factor in the case. There is no operation of a mechanical nature known to dentistry requiring as such any more "exquisite technique" or greater refinement of manipulative skill or finer artistic sense than hosts of skilled mechanicians in other arts are called upon constantly to display. Witness the work of the lapidist, the engraver of gems, the die sinker, the jeweler and watchmaker, the carver and sculptor and many others. What maker of dental prosthetic appliances, what dental operator has ever excelled these; how many have ever approached them in their creations viewed simply as products of manipulative skill? Therefore, it seems to your essayist that in all our talk and self glorification concerning our mechanical skill and "exquisite technique" we have mistaken our position and glorified the means while overlooking the end for which this mechanical work is done. Dental mechanics has gained all of its dignity and importance because it is done upon the human body for the cure of certain vital defects and ailments to which that body is subject and dental mechanics has grown in greatness and importance in proportion to the perfection with which it fulfills that end.

It is because of this view that a knowledge of the human body became necessary to us as a part of our educational equipment. Within certain limitations it is necessary for us to know the composition, the structure and the mode of functioning of this human machine, an important part of which it is our province to repair when defective and to keep in order to the end that it may be maintained in health. The necessity for this knowledge becomes more and more evident the more critically and carefully we study our art even if we view it only from the mechanical standpoint. How can an appliance be made to restore the function of mastication without a knowledge of the function of mastication as a basis or point of

departure in the manufacture of the restorative appliance, and if we admit the necessity for such elemental knowledge we are launched at once upon the deep waters of anatomy, chemistry, physiology and pathology before we have even begun with mechanics.

Teeth have been filled, as the term is used, for some hundreds of years. Our records indicate that even in the tenth century gold was used to stop cavities of decay in human teeth. How well it was done is not stated, and in the millennium since that time the mechanical operation of plugging gold and other metallic foils into cavities of tooth decay has been empirically performed with all grades of skill from the "exquisite technique" to the "abominably inefficient" until our own time, when, as the result of an appreciation of the vital factor, two giant intellects attacked the problem from that standpoint and the dictum of one came from Berlin crystallized in the maxim, "dental caries is a germ disease" and the other was the dictum of the giant from Chicago "The margins of a cavity must be laid upon areas of tooth structure that are relatively immune to the attacks of caries-producing organisms in order to prevent a recurrence of decay." None has seriously questioned the truth of either, for the demonstration of the truth of both has been final and convincing.

But what of the mechanics and the "exquisite technique" in this connection? The answer is not far to seek, by virtue of the dicta of these two master minds in our profession the mechanical operation of filling carious teeth has been transferred from a basis of empiricism to a basis of scientific rationalism and the operator is classified in accordance with his conception and application of the principles which I have quoted. Because of this revelation of Miller and of Black of the vital factor in dental caries our operative procedures for the cure of this disorder must of necessity be modified in accordance therewith and must of necessity be adopted to the limitations which this vital element imposes; therefore, we may well ask by what right shall a man attempt to do a filling operation upon other than rational lines and how can he even know how to intelligently shape a cavity for a filling without a fair knowledge of bacterial pathology and for the causes of caries in particular? But our problem is a still larger one. Why do we fill teeth, to what end or purpose have we developed through long centuries of endeavor this exquisite technique, this wonderful diversity of methods and ingeni-

ous contrivances that have become necessary to our work in this connection? Is it not solely because we hope by this mechanical operation and its associated procedures to arrest the destructive progress of tooth decay and thus prevent the eventual loss of the teeth? If that be our purpose then we may well ask, is it reasonable or rational for us as intelligent members of a profession that some are even inclined to classify with the learned professions, to begin our preventive measures long after the ravages of dental disease have accomplished much of their destructive work in the mouth? Is it compatible with the claims that we make for ourselves, our scientific advancement, our learning, our manipulative skill, that we have done so little in the domain of preventing the diseases which it is our province to treat all because we know so little about the remote and more intimate causes of them? Is it not high time that we rise to a higher conception of our mission as servants of humanity and develop a more earnest and sympathetic attitude toward the kind and extent of work necessary to solve some of the foundation problems that the vital factor in our professional work imposes?

It is now over twenty years since Miller gave to the world the results of his epoch-making studies upon the etiology of dental caries—from which we know that caries is a germ disease and from which we know that it can be artificially reproduced in a culture medium of fermenting bread stuffs inoculated with caries-producing fungi, but we do not know why one individual is susceptible and another is immune to this disorder, the question of cleanliness or uncleanliness in the individual does not alone account for this difference. All the work that has been done with the hope of discovering a germicidal element in the oral fluid of carious immunes has thus far ended in negative results and in the study of this question we are being steadily driven back nearer and nearer to the deeper questions concerned in bodily nutrition. The same situation is also true of the etiology of those other two great sources of destruction of human teeth, viz., dento-alveolar pyorrhea and dental erosion so that whether we will or will not we are inevitably being forced into the very position which the teacher whom I have quoted objects to, viz., "excursions into the doubtful realm of medicine," for two reasons, first, because what may in one sense be regarded as the more precise, material and practical resources of dental mechanics

which we have called to our aid and upon which we have depended through the centuries has thus far proven itself wholly inadequate as a means to the end in view and must ever remain as the material demonstration of our inability to prevent, though we may patch up the effects of the destructive process. Secondly, we are being driven into the field of medical science because in their essence the vital problems of dentistry are in nowise different to those of the healing art in general and because it is in that direction that the greatest light has come and will continue to come.

I plead for the unity of dentistry as dentistry and deplore the tendency not infrequently manifested by the manipulative man, the man of mechanics and of exquisite technique, the so-called practical man to not only disregard the surpassing importance of the vital element in our work, but to glory in the belief that his own sphere of activities comprises all that is embraced in the field of dentistry. I ask for a larger view of our noble calling than such a condition of mind indicates and a more sympathetic and helpful attitude toward those who without hope or desire of reward are laboring to solve the hidden mysteries of the vital side of our work. Let us have a larger conception of the meaning of the word practical and realize that the end of all scientific work is necessarily practical in the superlative degree. The telegraph, the telephone, the steam-engine, the Bessemer steel process, were in their inception scientific theories, but in their practicality they have civilized the human race and made life as we now know it well worth the living.

The scientific workers in dentistry, those concerned more particularly with the study of its vital problem, have already driven their investigations beyond the limits of the accepted standards of the dental educational curriculum and well over into the field of medical research, so that today we are seriously confronted with the inadequacy of the present methods and extent of dental training if we are to keep our students apace with the advance guard in professional equipment and attainment.

The pressure upon us for a revision and enlargement of our educational system has reached an acute stage, we can no longer ignore the fact that we are at the parting of the ways, one of which leads to a broader and nobler professionalism, the other to a mediocre specialism. So evident is this situation to the minds of thinking men in dentistry that the president of the International

Dental Federation will say among other things in his announcement of the coming meeting in Amsterdam, "The question which now after a period of comparative quiet is again agitating the minds of dental teachers and practitioners as well, concerns the education which should be demanded of the dentist in future. The question whether the dentist should above all things be a full graduate in medicine with a knowledge more or less complete of dentistry superadded or should begin somewhat earlier to so shape his course as to best enable him to meet the demands which his profession and his patients make of him, is one which the F. D. I. pronounced upon in its sessions at Stockholm in August, 1902. In the meantime the question cannot be considered as having been definitely disposed of. It is on the other hand perhaps more acute at present than at any previous period in the history of our professional development."

The problems of tooth loss and tooth destruction are dental problems, but because they involve the vital factor then for their solution must be brought to bear all that is to be known of the phenomena of vital action, cell activity, nutrition, physiologic chemistry and the whole group of correlated subjects necessary to the understanding of the vital factor. Are we to surrender this, our birthright, to the scientific researchers of general medicine and rest content with our attainment as mechanics or shall we go in and occupy this promised land, claim our birthright and make of dentistry what by virtue of its inherent possibilities it potentially is now, a really learned profession?

If we are to do this larger thing we must escape from the limitations of the idea that we can train a student for the intelligent exercise of his profession in three annual sessions of thirty-two weeks, for it takes longer than that to make a good plumber, carpenter or blacksmith. We must not only lengthen the course of instruction but enlarge it by the addition of a considerable number of elective studies which will enable the student by wise selection therefrom to develop strongly in those special departments of professional work to which his tastes and tendencies best adapt him and all of this should be done in the dental school for reasons of pedagogical economy and because the animating motive of dental education first, last and all the time should be the making of the best dentist, not the making of a physician with a dental appendix to his medical education.—*Dental Review.*

ANTISEPTICS AND GERMICIDES IN THE LIGHT OF SOME OF THE MODERN PROGRESS IN CHEMISTRY AND PHYSICS. By Henry Leffmann, A.M., M.D., D.D.S., Philadelphia. Chemistry is a comprehensive science and the only fundamental science, perhaps, studied in the dental and medical courses.

The problems of life are essentially chemical problems. We would go far astray if we would assume that they have, as yet, been solved. Journals and newspapers often contain statements of wonderful discoveries and advancements in the solution of problems of physiology; but, when we come to examine these statements, we find that what has been made out is some detail of physiology or pathology, and that the essential secret of life is as yet unknown. There has, nevertheless, been a considerable advance along the line of a more precise comprehension of some of the intricate problems of physiology. New light has been thrown upon certain phases of action by discoveries that are not in their origin directly connected with the problem. It is curious that one phase of these discoveries has come to us through a botanical investigation, the studies of a German botanist, who tried to learn something of the conditions under which the transfusion of plant juice occurs. His results did not lead him, naturally, toward any chemical question, because he was not a chemist and not interested in that phase; but his experiments led to a study of the transfusion of other substances and to other investigations, with the result that we have to-day certain theories dominating the chemical world, and which are, in a way, throwing much light upon our laboratory phenomena and through that upon the phenomena of life.

I want this evening to present a few of these views and to show their bearing upon some of the common phenomena in regard to antiseptics and germicides. Let me define my terms, because that is the exact feature of expert knowledge. By antiseptic we mean a substance which restrains putrefaction; by germicide, a substance that kills the organisms, commonly called germs. You will recognize that the word, germicide, represents a rather more powerful action, for the antiseptic may be merely a restraining influence. Ice, for example, is an antiseptic, but it is known that the minute organisms will live for months in ice, and that when the ice melts they will go back into activity. In many surgical applications the substance acts more as a restraining agent than as a true germicide,

because the more powerful bodies which are real germicides are unsuitable, because they are too destructive. Bearing this in mind, I will try to draw some practical points.

One of the earliest demonstrations in the chemistry course is that water promotes chemical action. Materials will remain in a quiescent state for a long while, but as soon as they are put into water they will act. The ordinary baking powder is a good example. The view that water acted by bringing the substances into closer contact was accepted for a long while, but it is not now accepted as the whole explanation. The view now held is that when certain substances are dissolved in water they are modified, to a limited extent, and acquire much greater chemical flexibility. This idea has more or less of an accretion character about it, and here and there terms have been introduced. Therefore, there are a certain number of terms, which have come into use, and which I wish to define with the other terms, that we may use them here to save round-about expressions.

There are many substances that dissolve in water, but there is a considerable number of substances so slightly soluble as to be called insoluble. The former class is divided, according to action of the water, into two groups: those which are altered in solution, so as to acquire electrical charges, and those substances which are not so affected. This action does not depend upon the introduction of electricity, that is, has nothing to do with the passage of a current of electricity. It is an action developed by the method of solution, and is not at all by electrical action. For example, with sugar placed in water, the molecules are scattered, but the sugar remains as sugar; but if we dissolve common salt in water, the modern theory is that the salt at once acquires two opposite electrical charges, and that the sodium atoms of salt acquire a positive charge and the chlorin atoms acquire a negative charge. This does not result in separation of the particles. The sodium atoms remain with the chlorin atoms, but they have taken on this electrical condition. This renders the molecules much more susceptible to chemical change, because there is now a tendency, on the part of these atoms, to obey attractive influences which they would not obey if they were not so charged. If, while the sodium and chlorin are in this condition, we turn into the water a current of electricity from any electrical apparatus, we notice that the positive atoms of the sodium,

following the law of electrical attraction, rush to the negative pole, and that the negative chlorin particles travel to the positive pole. These portions have been called "ions," because they "wander," respectively, to the poles. This takes place with a large number of substances, and if the substance contains more than two kinds of atoms, as there can be but two electrical charges, some of the groupings must be duplicated. This development of electric charges is called "ionization." These problems have been worked out by a large number of experts, and with this work has come that phase of science, so characteristic of the nineteenth century, namely, precision; because it has been necessary to have exceedingly pure materials. One of the problems has been the preparation of very pure water. Ordinary water will contain sufficient mineral matter to disturb the relations. If you put a grain of common salt at a break in a wire conducting an electrical current, the current will not pass. If, however, the salt is dissolved in water, the current will pass. The explanation is that, as soon as ionization occurs, the ions rush to the electrical poles, carrying the charges with them, and are neutralized. It has been determined that certain substances are capable of this transformation that renders then susceptible to currents. It is, however, known that the capacity of water to do this differs with each substance, and that the more active the ionization, the more active the chemical substance that is produced; so that, to a certain extent, the activity of substances is the degree of their relation to ionization.

Among the ideas that have grown out of this is the belief that the property termed "acidity" is due to the power of the substance to ionize in such a way as to put hydrogen in its positive ion. The strength of the acid is due to the facility with which it ionizes. We now believe that this is the explanation of why some acids are weak and some strong. Boric acid ionizes very feebly. All substances do not take on this change to any great extent, and, consequently, are not active as acids.

It has been found that quite a number of substances do not ionize at all. They make solutions, but do not acquire these properties. Among these are the starches, sugars and gums. They are much feebler and do not possess the acid characters, nor are they susceptible to the electrical current. Water is the most powerful of all ionizers. Alcohol, ether and chloroform are compara-

tively feeble. Curiously enough, the next most active ionizer is formic acid. This acid has comparatively high ionizing power, and has freezing and boiling point about the same as water. Alcohol and glycerin, two familiar solvents, are not very active ionizers.

Another function of water, which must not be overlooked, is that it enters into combination with a number of substances in such a way as to alter the substance completely, and also to alter the water. This process is dependent upon the taking up of the water atoms into the material, with a resulting redistribution of all the elements in a new form. An example of this is seen in the slaking of lime. In slaked lime there has really been produced a new substance, which is neither water nor lime, but which contains the elements of them in a new distribution. This is called "hydrolysis." We must distinguish between this and ionization. In ionization the elements are modified by their presence in the water, not by taking up the water. In the hydrolysis the water acts in combination.

It will be seen how this leads to certain ideas. It has been known in medical practice that the ordinary iron chlorid is not satisfactory in water solution; that it is liable to decomposition, and that in alcoholic solution it did not produce this change. We now know about the reason for this. The water acts by hydrolysis, converts it into hydroxid, liberating acid. In alcoholic solution there is less action, because water is the minor ingredient. The alcohol holds the water with sufficient firmness to prevent it acting on the other substances. It would seem that watery solutions do not represent the same as solutions of alcohol and glycerin. So far as the internal administration of them is concerned, that may be true, because the liquid is taken into the system and very largely diluted with the water of the fluids of the system. It is well to remember that the watery solution is the most active, and that the alcohol and glycerin solution may not be nearly so active. We see an example of this in phenol or carbolic acid. Phenol, in its ordinary form, is rather corrosive, but when mixed with alcohol it is much less corrosive. I have had occasion to notice the antidotal action of alcohol. Having accidentally poured some phenol over my hand, I did not notice this at once, but feeling the pain, I looked, and found a patch of several square inches in area perfectly white. I had read of the use of alcohol as an antidote to phenol, and poured it over my hand. Had I not known of this I would have poured

water on the phenol, and I would then have had a bad condition of the hand. Almost immediately the sting of the phenol went away, and the hand was restored to its normal condition, except for a slight roughness. The very different effect is probably due to the difference of the character of the solution of the alcohol and the water.

A somewhat natural conclusion would be that, as most of the powerful antiseptics and germicides belong to these more active chemicals, they should be used in watery solutions, and that, when using alcohol solutions, it would be safest to use those substances which are, in the free state, in more or less active form. Iodin dissolved in alcohol would be expected to give us fairly good results, but we would not expect to get from phenol in alcohol or in glycerin the same result as from water.

The principle is somewhat abstruse, but has dominant influence in the explanation of the phenomena, and it has been thought to have a bearing on the action of germicides, many of them being substances which, by their ionization, produce marked effects.

Another point in regard to antiseptics and germicides is that modern investigation has shown that they are very susceptible substances to the action of each other, and that, consequently, they should not be used in mixtures. Some of the incompatibilities of these substances are singular. It is a singular fact that potassium permanganate, which is highly oxidized, should be incompatible with hydrogen dioxid, which also gives up oxygen freely. We would suppose that the two substances would strengthen one another, but they decompose one another. A curious fact, which I may mention, is the recent discovery that some of the large manufacturing companies are putting acentanilid into hydrogen dioxid to meet the difficulties of transportation in this country. In the course of a few months the odor of bitter almond is acquired by the substance, and in this way the acetanilid can be detected.

We also learn, in connection with our studies of the action of these antiseptics and germicides, that, as the albuminous materials which form the protoplasm of living organisms are coagulated by a number of these materials, they may, in a measure, protect the inert portions through action. The main objection to "antiseptic" soap is that the particles cannot remain long enough in contact to do any real good. In the ionization of the elements of the soap we

have not an active germicide, but some new product, which is almost inert, because it is almost insoluble. It has seemed to me that some of these newer views might serve to explain some of the common phenomena of chemical action and make the contrasts between the ordinary substances which we call the salts and those which belong to organic chemistry. We can see why a solution of salt would be more irritating than sugar or starch. The solution of salt has acquired chemical powers by ionization.

The subject is, in this limited way, open to you in a couple of phases. Possibly the members will have misunderstood something, or will have followed out some line of thought which they may wish me to explain, and I shall be glad to do so if I can. In accepting the invitation to address you to-night on a subject of this kind, I have appreciated the abstruseness of it; still, I think there is something gained. While I think the doctrine of ionization is ruling men too much, nevertheless, out of this extreme enthusiasm will come some results; and, perhaps, the world is moved largely forward by the work of the enthusiasts, who do not see very clearly the objections and difficulties of their problems.—*Dental Brief.*

ORAL HYGIENE IN PUBLIC SCHOOLS AND INSTITUTIONS: WHAT ARE WE GOING TO DO ABOUT IT? By Richard Grady, M.D., D.D.S., Annapolis, Md. A dental practitioner's insistence upon the value of the teeth and the importance of their preservation is quite often regarded by the laity as a professional exaggeration which need not be taken too seriously. What is said in dental journals is, to a great extent, ineffective, because of their failure to reach the people. Hence the progress of public sentiment respecting the teeth has been necessarily slow.

It is seldom that we have an opportunity to declare ourselves in public, or that anything said by us on the subject of dentistry, or the teeth, commands general attention; yet when Professor Osler, in an address in England last fall, urged that the mouth and its contained organs be kept in a clean and hygienic condition, together with routine inspection of the teeth of school children, and educating the public along dental lines so that better nutrition and consequently better health may be secured, these sentiments,

which have been uttered by us for years, were published in many medical journals and newspapers, accompanied at times with favorable editorial comment.

Can I find anything new to say on this question, which is assuming greater importance in the minds of conscientious and progressive practitioners, whose sole and unselfish purpose is to promote hygienic conditions in the mouth, and who recognize that there is a responsibility resting on the profession which should command serious consideration? Can I place old thoughts in such a new light that they may, perchance, strike a responsive chord, and by so doing stimulate other thoughts to our advantage? I speak from the varied experience of twenty-seven years as a visiting dentist to schools and institutions, and an opportunity such as few, if any, dentists have had of noting the teeth of young people from six to twenty-four years of age.

We stand in the limelight of the twentieth century, and have earned for ourselves an honorable place; but judged by a distinguished educator quoted by Dr. Potter of Boston: "The dental profession seems most interested in repairing broken-down structures, and too little in preventing such conditions;" or, in the words of Governor Hastings of Pennsylvania: "Dentists live inside a tooth until they become cranks."

In these pictures we "see ourselves as others see us," and the words are somewhat confirmed by Dr. Crawford of Nashville, who says: "We get together and brag about being the greatest profession in the world. Let us get up and stop bragging, and do something! Dental caries is ravaging this country; this is attributable very largely to our lethargy. Let us get up and do something; then the people will stop calling us 'tooth-carpenters,' and will pay some attention to what we say. We should act as a solid phalanx, and when a man sees a right thing he should endorse it, whether it comes from the East, West, North, or South. Let us stand up for what is right."

Dentistry as an organized profession is younger than either law or medicine. The public is consequently not so familiar with it and the benefits it confers, but gains its knowledge largely from grossly misleading advertisements of the dental parlors. Many dentists do not take the trouble to teach their patients how essen-

tial sound teeth are to their well-being—the relation of clean teeth to good health—that cleanliness does away largely with the tendency to decay. A campaign of education should be carried on in every dental office, and by every dental organization. The responsibility of every dentist is great; the responsibility of every dental and medical school, and of every dental association and dental examining board, is greater. We are all responsible to the future. "That one should be ignorant who has capacity for knowledge—this I call tragedy," says Carlyle.

Civil service reform is so wide in its scope that we find it has special interest for every class of the people. The fact that it requires a physical as well as a mental and moral examination of candidates for office commends it to all who are especially interested in the physical improvement of the race. The hygienic value of the dental feature came out unexpectedly at a meeting of the National Civil Service Reform League, which I attended recently in this city. One of the speakers told of a mechanic in the "East side" of New York, who, having achieved popularity in his neighborhood, aspired to become a "ward leader." A proper preliminary step, he decided, was to be enrolled on the police force. He attended night school to fit himself for the necessary examination, which he passed with credit; but he was rejected by the physical examiners on the ground that he was the victim of dyspepsia. His teeth had been neglected in his youth, mastication was imperfect, and dyspepsia was the result. The examiners held very wisely that dyspepsia tends to irritability; and that a man suffering with this disease would lack the judicial calm which is so characteristic of the New York policemen. The man was an altruist in spite of his dyspepsia. He went to his friends and supporters and told his experience, and the result was a boom in toothbrushes throughout the entire ward.

If we expect immediate results from education, we shall be disappointed. It is safe to estimate that it takes a period of from thirty to fifty years—let us say the time of one generation—to secure the popular approval of matters of minor importance; while to establish greater principles, a longer period is usually involved. If we take a more extended view of the subject, and point the public in the right direction, the condition is not hopeless. It is

"up to us," in the language of the day, to follow the high ideas of Dr. S. G. Perry of New York, who says: "The social as well as the professional status of the dentist of today is determined by the dentist himself. If he be an educated gentleman, all high places will be open to him." As to the future, he says: "I venture to predict that we shall acquire a keener sense of our responsibilities, be more alert in the prevention of diseases of the teeth, and more careful to instruct our patients in their proper care. We shall be more alive to the importance of prophylaxis. It will eventually assume first place in our practice."

Dr. Evans, in his "Memoirs" just published, says of Napoleon III, "He found the dental art to be of great use to him, and accordingly had an excellent opinion of dentists in general, and saw no reason why they should not be as proud of their specialty as the practitioners of any branch of medicine or surgery;" and adds, "I was richly repaid in many ways, but more especially by the direct support and encouragement he gave me in the practice of my art and the social consideration he afforded to me, and through me to my profession. At a ball to which Mrs. Evans and myself had been invited, we overheard a conversation. 'Who is that woman?' said one lady to another; 'she is so delicate and ladylike —she looks like an American!' 'Yes, she is,' was the reply; 'and only think, she is the wife of a dentist! How dreadful!' A few minutes later the emperor approached us and shook hands with us both.

"As an American citizen I had never thought it would be necessary for me to feel ashamed of myself socially, or that I was to be deprived of the privileges and civilities usually conceded to practitioners of the liberal arts and professions. The emperor quickly saw how I felt about the position I was to hold in his immediate *entourage;* and, since he was not disposed to recognize distinctions of any kind among men, except such as were determined by intelligence, personal accomplishments, or special abilities, I was very soon admitted to the Elysée officially on a footing of equality with doctors of medicine, surgeons, university professors, and men of science in general. When the court was established, I received my appointment of 'surgeon dentist,' and in the same form and on the same terms as the other doctors and sur-

geons. My court dress was the gold-embroidered special uniform worn by every member of the medical staff. We all received the same compensation. Once having a standing at the imperial court, the way was opened for my reception at other courts. I am sure that the consideration which had been shown to me by nearly all the royal families of Europe has been of very great service to me personally; and I am equally sure, but still more pleased to believe, that my profession has been benefited and honored also."

All of which—especially the "footing of equality with doctors of medicine," "same compensation," and "gold-embroidered special uniform worn by every member of the medical staff"—is in striking contrast to the picture presented by Dr. Oliver, U. S. Army Dental Surgeon at West Point, in his paper at the last meeting of the National Dental Association. He said, " The present status of the contract dental surgeon is continually a source of humiliation and degradation to all, and to those more sensitive men, who have occupied social positions at their homes equal to the best in their several communities, it is, of course, more keenly felt. In the matter of uniform we are especially unfortunate. . . . It is absolutely impossible to tell a dental surgeon from an enlisted man of the Hospital Corps at a distance of ten feet. . . . It seems a great injustice to educated professional men, who have spent years in acquiring a technical and scientific knowledge of their specialty, and who have qualified before a competent examining board before entering the service, to be so meanly uniformed. . . . What is urgently required is . . . that there may be some future held out to the successful and efficient dental surgeon . . . where he may enjoy the social distinction of a post without reserve and without feelings of humility, and can appear like the rest of the officers at the various functions, formal and informal, and who at various military ceremonies can feel and act as an officer and a gentleman."

With the development of the mechanical aspect of dentistry, which has resulted in such a degree of perfection in methods, appliances, and technique of dental practice as to leave little room for further improvement of a radical character, has come, as a result of experience, a fuller knowledge of its limitations as a remedial agency. It may be pleasing to some to learn of the ad-

miration of the English writer who tells in the *Fortnightly Review* that "hundreds of thousands of dentists are forever filling and scraping and pulling American teeth," and who says, "The American dentist is the greatest in the world. Not only does he produce an exact copy of nature, but his is the only instance known to science where human ingenuity excels nature's—his teeth do not ache;" or the words of Oliver Wendell Holmes, "The dental profession has taken from old age its most unwelcome feature, and lengthened enjoyable human life far beyond the limit of years when the toothless and purblind patriarch might well exclaim, 'I have no pleasure in them!' "

I believe we have come to a point in our history where we should take another step, and a very important one, where, in the words of Edward Everett Hale, "We must serve the world, not like the handcraftsman, for a stipend accurately representing the work done, but as those who deal with infinite values and confer benefits as freely and nobly as does nature."

Not repeating what I have previously written, except for reference, I want to plead in this twenty-minute paper—and not tax your patience longer—for oral hygiene—which includes dental examination and attention—in public schools and institutions for the children of the state, such as schools for orphans and the blind, hospitals, reformatories, and fresh-air societies; and to ask the members of this union meeting to say what they are going to do about it; especially in providing leaflets to be used in school physiologies.

Personally, I have been earnestly striving for years to make instruction in oral hygiene an essential part of public school education, which would be an agency to bring such knowledge into the home life of the people, thus identifying it with the health of the household. I have made routine examinations of the teeth and recorded them on charts—which correct errors in those previously published—thus confirming statements that a systematic examination of the teeth of children at home and abroad reveals the fact that from ninety-two to ninety-five per cent have defective teeth, so that there is no longer need of further statistics of this kind; have called attention to the mischievous teaching respecting the teeth in school physiologies; have issued pamphlets to school of-

ficers as a means of spreading information respecting the need of teaching oral hygiene in public schools, believing that school officers and other friends of education will be most willing to receive it. The parent, the teacher and the newspaper editor, it is hoped, will be enlisted in the cause. The scheme is essentially an educative one, and thousands of dentists, scattered throughout the country, who command confidence and respect, can be counted on to assist in the work, which would be entirely altruistic and free from what might be called professional selfishness. Now what have you done, personally?

In this city (Washington) Dr. H. C. Thompson informs me, relative to school hygiene: "We undertook that work on plans of extensive scale, when, by reason of the superintendent, it was stopped. He wanted us to do all the work and give the results to him, thereby giving him credit for it all, and allowing the profession to remain in the background. Of course, everything stopped right there, and still stands *status quo.*"

In Baltimore, a committee of which I was chairman—with Dr. B. Holly Smith, the president of the National Dental Association, who appointed the committee on oral hygiene in public schools, Dr. G. Marshall Smith, who seconded the resolution in the National Dental Association calling for the appointment of the committee, and Dr. Wm. A. Mills, on whose motion the Maryland State Dental Association appointed a standing committee on oral hygiene—appeared before members of the school board by invitation fully four years ago, and requested permission to examine the mouths and teeth of pupils from six to fifteen years of age in four white schools and one colored school in different sections of that city, and to give brief talks to the students of the city college and high schools on the care of the teeth.

We argued that few persons realize what an important part the teeth play in the preservation of health, presenting statistics, and saying that we would inculcate in children the virtue of mouth-cleanliness, and teach them hygienic habits which would stand them in good stead their life long; that no difficulty ought to be encountered on the part of school officers in introducing lessons on the care of the mouth and teeth. After the meeting I was told by a member of the board that our arguments made no impres-

sion. As Dr. Hayden said about his idea of a national convention of dentists in 1817: "The pear was not ripe."

Why we failed at that time has been partly explained: (1) In the statement that one of our professional brothers—who couldn't conceive how a man who is really competent would devote much time to work that did not directly promise a money return—had represented to a rabbi, a member of the school board, that our motive was mercenary and that we wanted the pupils for patients. (2) In the conversion of the *ex-officio* member of our committee to these unfair and prejudiced sentiments of another member of the school board: "The method would make the public schools unpopular; the movement would not be tolerated by the Johns Hopkins University and Woman's College; hence why should the poor man, because of his necessity, be subjected to anything he would resist were it in his power? By what authority does the school board order such an examination other than that it would affect the health of the neighborhood pupils by infection?" (3) The indifference of members of the association, fifty of whom were invited to appear before the school board and only five of whom responded. In this connection I want to record my recognition of the broad-minded president of the Johns Hopkins University, Dr. Ira Remsen, then a member of the school board, who said to me, "I am in favor of it on your statement without any argument."

Our experience is not singular, but is very much like that of the committee in San Francisco of which Dr. Frank L. Platt tells. He is particularly interested in the examination and care of the teeth of the children in school, though he does not know what course can be taken to bring about that much desired condition of affairs. He said that he was appointed on a committee to interview the board of education in San Francisco to see what could be done there, and he does not believe that he was ever treated more shabbily in his life, although he started out with honest intentions. On reviewing the work done in Europe and in some of our eastern cities and states, the committee did not seem to be at all impressed with the importance of the matter. When Dr. Platt referred to the fact that several years before the board had appointed an oculist to examine the eyes of the children in schools, it was insinuated that pecuniary profit had a part in the motives of

the profession concerned. These bodies must be impressed with the importance of this work. Back of it all there must be a change in education; dentists must be better educated. With men and women who realize the importance of this specialty, and who are enthusiastic, there will be an impulse that will not be put down. Dr. Platt stated that he had spent considerable time in working along this line, and is utterly disheartened to find how few men or women are really enthusiastic. Most of them are working for bread and butter. It is hard to arouse any enthusiasm, and I think the fault lies in the foundation—in the teaching. It is of vital importance to the coming generation of people in this and every civilized country that mouths be taken care of. If the authorities could be so impressed with the importance of this matter that they could not pass it over with a slur, then something might be accomplished. It might be a good plan for some of the profession to be elected mayors of cities.

If dentists can't become mayors, as advised by Dr. Platt, they may become school commissioners like Dr. Stiff in Richmond, where "absolutely no objection was raised and consent was at once granted." He writes, "I have found absolutely no opposition on the part of teacher, scholar, or parent."

I need hardly say to you, in conclusion, that our responsibility is the central thought of this paper; that the limited instruction given in our public schools on the care of the teeth is not sufficient; that the mere filling of a tooth—as typifying dental clinics —or the reading of papers to and at each other, is not fully living up to our obligations.

We are called upon for more than this, and our code of ethics demands that we shall "educate the public mind so that it will properly appreciate the beneficent efforts of our profession." It is time that those who would call themselves "professional" should truly realize the needs of their fellow men, for the health of the individual, for the comfort of the family, for the welfare of the state.

Dental education of the public, especially the children, given by and under the auspices of our district society and state association, will do more to stop quackery than legislation—a thing that ought to be done and should be done. "It is a holy thing," in

the words of Lord Beaconsfield, "to see a nation saved by its youth."—*Dental Cosmos.*

THE RETENTION OF TEETH IN THE JAWS. By A. W. Harlan, M.D., D.D.S., New York. It goes without saying that the first duty of a dentist is to prevent disease of the soft tissues of the mouth, and prevent the loss of teeth by repairing them when carious, or when they are damaged by accident.

It is not my intention to speak to-night about the filling of teeth, by inlays, or metal fillings, nor is it my wish to enter into the details of uniting teeth by the use of bridges or bars set into teeth, but I intend to speak of the retention of teeth in the jaws by the practice of conservative operative dental surgery.

The most fascinating branch of dental surgery to me is that phase of practice which permits of the use of finely tempered delicate instruments within and around the roots of teeth. I was early impressed with the imperative necessity of possessing instruments suited to operating within the roots and around them. When the Arthur System of prevention of decay of teeth was first published, I was opposed to it, and have been to this day. The disks and cones which came with that system have caused more disease of the gums than almost any other agency (misapplied by the dental engine) in practice during the years from 1872 to 1890.

There are many persons now living whose teeth were mutilated and misused during these few years, by disks and cone-shaped steel and corundum points, to their sorrow since their teeth were operated upon.

In a diagnosis, it is my invariable rule to examine every tooth; first for vitality, second for caries, third for deposits on the roots, and fourth to note the number of teeth in the jaws.

Teeth are to be considered as a whole, for purpose of use, but they are to be treated singly, in order to maintain them in a state suitable for retention in the jaws.

To retain teeth in the jaws during life is a difficult task. If it were not, there would not be such a demand for special dental knowledge. This necessity is growing faster than the supply of men especially instructed and educated, and in consequence there are many toothless persons now, where there should be only a few per thousand.

Every day I see middle-aged people, and even those under middle age, with teeth lost which might have been saved by the intelligent practice of conservative dental surgery.

By the aid of electricity, we can see through the teeth and jaws with such ease that there is no longer an excuse for having flattened and nodulated deposits on the roots or between them. We can even determine when the bony sockets are carious or necrotic, or when there are growths upon the roots or within them, or growths over the apices of roots. In a short period any dental surgeon may so acquaint himself with the variations from health of the gums, normal to abnormal, that his services will be invaluable. Every portion of the neck of a tooth and its root must be examined with delicate probes, fine paraffined silk and the electric light to ascertain the exact conditions.

The fingers must be trained so that the most delicate operations may be performed upon the roots, as nearly in the field of vision as possible. Compressed air is always an aid in keeping the field of operation clear of blood and debris. When teeth are sensitive to touch, a course of massage with magnesia or soda for a short period (two weeks) is always advisable.

The malocclusions of teeth must be corrected by grinding, and teeth which have no antagonists must be provided with them or they will be lost. No pocket or pouch alongside a root must be left to be filled with food or other foreign matter; it must be cut or scraped out or burnt, so that the tooth can be kept clean.

It is better to have the gum fit closely around the neck of a tooth, even though it only covers one-half of it, than to leave a place to be filled with decayed and decaying matter.

All the teeth that are filled by inlaying or filling, should be contoured to protect the interproximal gum tissue. There are no exceptions to this rule. All crowns and abutments should be so fitted that the interproximal space should not be impinged upon, otherwise even in a short period there will be developed pockets for the further destruction of the pericementum. These are so difficult to treat, after they are once developed, that the integrity of the gum tissue may be impaired to such a degree that it never becomes normal again.

Erosions of the teeth and abrasions of the ends of teeth are treated mechanically or by the administration of drugs, which may correct or modify the secretions. Poisons collecting in the

alimentary tract through lack of ingestion of a sufficient quantity of pure water are to be treated by flushing the system with water and eliminating smoked and pickled meats and fish from the diet.

The greatest care on the part of the dental surgeon will not retain the teeth in the mouth of a patient without a full co-operation of the patient himself.

The teeth must be kept clean, even if you must see them every week or every month. This is a matter of training. The mere rinsing of the mouth once or twice per day with any kind of a mouth wash will not keep the teeth clean. They must be scrubbed and rubbed and rinsed as carefully as the hands are washed. The interspaces must be cleaned and kept free from food.

Any person who is a mouth-breather, desiring to keep his teeth, must have his nose opened, so that the air will be taken in and expelled through that organ.

In attempting to retain the teeth in the jaws, you must take a real personal interest in the matter. All teeth having abscesses, blind or otherwise, must be so treated that they will give the minimum of discomfort to their owners. If it is a necessity to amputate a portion of a root, do it. Conservatism here is needed, as many teeth are lost in a short period by pathologic processes.

I have no new theory to offer you to-night with reference to treatment of morbid conditions of the gums, but I will say this: I have been able to disperse thickened areas of gum tissue about the ends and over the sides of the roots of teeth, pulpless teeth, by the use of the concentrated blue light. In these cases an exposure of from two to five minutes daily has been all that they required. I hold the lamp within from one-quarter to one-half inch from the gum, always having the room darkened. If the heat is too intense, I suspend operations for a minute or two and resume.

The most rigid cleanliness that I can obtain is maintained during the treatments and in the intervals. As a preliminary to these treatments, when there are pockets alongside the roots, I wash out all the debris and inject them with a solution of:

℞ Alumnol, ...gr. viij
Oil Betula, ...m. iij
Distilled Water .....m. xc-M.
Sig.—Use as directed.

I place a cotton roll inside and outside the arch, and let the medi-

cine stay in the pocket one or two minutes. The next day I use the blue light, and so on daily for two weeks, or longer, if necessary.

Loose teeth can be retained in the jaws for long periods if the hygiene of the mouth is good and the teeth are fastened to each other so that there will not be too much movement in their sockets.

All teeth that are lame and sore to the touch must be restored to health by operations, usually within the roots, and after they are filled, by further massage of the gums and exercise. Nearly all teeth not being exercised are useless.

Teeth cannot be retained in the jaws for a long period if there are pieces of roots adjacent to them periodically inflamed and infected. Malformed teeth, not exercised, should be extracted for the benefit of those remaining in the mouth. If the roots of teeth are made clean above and below the gum line, and all foreign matter is removed by a strong syringe and compressed air, I deem it good practice to thoroughly irrigate the interior of the pockets and pouches by using a ten per cent solution of monochloracetic acid in each pocket.

I always use fine twilled silk between the teeth, to detect any ragged or rough deposits on the sides of the roots, drawing it gently, and as high as the gum will permit, and pulling it down slowly, so that some portions of the silk will be obstructed if anything remains on the root. It does not matter how much time you spend on the teeth, if you do not remove all deposits on the roots the gums will not become reattached, nor will they become normal in appearance. They will bleed, and a nest for microbes is established for the production of pus. I regard the integrity of the gums as the first requisite in retention of teeth in the jaws, and the maintenance of the mucous membrane of the mouth, nose and pharynx as next in importance. Every man must choose for himself the rules for beginning operations on the teeth or gums and try to put himself in the position of the patient. All of the books and periodicals necessary to learn the views of others should be studied and digested to the end that the latest discoveries in science and surgery may be utilized to make prophylaxis real, not a fad.—*Items of Interest.*

HAS THE STATUS OF CEMENTS CHANGED SINCE THE INTRODUCTION OF SILICATE CEMENTS? By D. C. Smith, D.D.S., Stouffville. I hold that the use or abuse of plastic fillings, and more particularly that of cements, has more to do in the way of increasing or diminishing (and more particularly the latter) a dental practice than that of any other branch of our practice, as the cements have to do with probably 99 per cent of our patients. You will agree with me when I say that you may impress as firmly as possible that a cement filling is but a temporary filling, yet the majority of patients (more particularly in the rural districts) who visit the dentist but once in three to six years soon forget, and the dentist is blamed for the lack of permanency of the filling.

Every practitioner, who has had any experience, knows that there are a number of cases where nothing but cement could very well be used, the condition of the teeth, as well as the age and purse of the patient, forcing us to that decision. This being the case, it is up to us to investigate and find out the status of the different kinds of cements we now have. We have no filling material to which we can apply the name "perfect," and therefore we must select from such as we have the most suitable for any given case, or particular class of teeth, considering, also, the condition of the cavity to be filled.

What, then, are we to do to overcome this deficiency? At present we have but three filling materials, which have survived the test of practical experience—gold, amalgam and cements—each of which possesses certain advantages which adapt it to certain conditions. But of the three, you will agree with me when I state that cements adapt themselves to the greatest number of varying conditions. Neither will my claim, that it has by far the greatest preservative quality by reason of its easy adaptation to the cavity and its harmony with the tooth structure, be disputed.

Let us enumerate some of the essential qualities of an ideal cement:

1. It must be of such composition as to be plastic during a short period of time and then rapidly harden.

2. In the act of hardening, it must neither expand nor contract.

3. It must possess adhesiveness, both while plastic and after it has hardened.

4. It must resist abrasion.

5. It must be essentially escharotic.

6. It must contain no organic matter.

7. It must be impervious to moisture.

8. It must be insoluble in the fluids of the mouth under all conditions.

9. The color should be such as to imitate the natural teeth.

10. The composition should be such that it will not be susceptible to changes or deterioration within a reasonable time.

To combine all these qualities in a single material presents a problem of no mean proportion, and to attain it would require all the energy that could be concentrated in scientific research, and is a splendid field for investigation for any of our young graduates who aspire to fame and honor.

The question for discussion to-day is, in how far are those qualities possessed by the zinc and silicate cements which we now have, or has the introduction of the silicate cements given to us in a greater degree that permanency and satisfaction which we are all longing for? Years of trial and failure have demonstrated the unreliable character of all zinc cements. It is the quality of insolubility which the makers of cements have been striving to achieve. Recognizing, therefore, that in the line of zinc cements no further improvement could be hoped for, manufacturers in different parts of the world have been searching for some new material, from which a true insoluble cement could be made. Among those materials which naturally appeal to the mind as types of permanence, are the rocks of early geological periods, as quartz, granite, silicates, etc. It has been believed that if those could be split up into their component parts and combined with some fluid so the thing would pass into a plastic state and again form a hard insoluble rock, or artificial stone, the problem would be solved and we should have the long-looked-for insoluble cement. That the acids or alkalies do dissolve zinc cement fillings has been so often demonstrated that I need not dwell upon this point. We must, however, admit, notwithstanding criticism, that they do fulfill a large number of the requirements which are recognized as essential in filling material.

What we are anxious to know is, in how far has the status improved by the introduction of the silicates?

A few years ago we had our hopes raised high in the Archite filling, only to have them blasted when we gave it a practical test in the mouth, as it turned out very brittle and did not wear any better than, not even as well as, the poorest zinc cement. It is with fear and trembling that we again decide to risk our reputation by the introduction of the silicate filling. Let us for a moment study the composition and qualities of the silicate cement. We find that Ascher's silicate cement (the one I am using) does not contain zinc or zinc oxid. The cement is composed of a powder and a liquid. The powder is composed of Kaolin, about 50 per cent; Silicium, about 25 per cent; Lime, about 25 per cent; Magnesium, about 2 per cent; some Beryllium, and some water that disappears when it is heated. This mixture (almost the same as porcelain body) is heated for several days to a temperature of 1,700 degrees C. The liquid consists of phosphoric acid, ortho-phosphoric acid, acetic acid and water. There seems to be a vast difference between a silicate cement and a zinc phosphate cement. The saliva of the mouth does not have the same effect upon a silicate cement as it has upon a zinc phosphate cement. In the latter we formed zinc phosphate, calcium phosphate and some other combinations which are more or less dissolved by the acids of the mouth; but in the former, the silicate cement, double combinations are formed, from Kaolin, plus lime and phosphoric acid, and silicium plus magnesium and the acid, and these double combinations seem to prevent the saliva from dissolving the calcium phosphate and the magnesium phosphate, which are the weak points in the zinc phosphate cements. Not being readily dissolved by the liquids of the mouth makes the silicate fillings in many cases preferable to the zinc phosphate cement fillings. The question arises, "Have we been using the silicate cements a sufficient length of time to warrant us in coming to a safe conclusion as to their permanency?" I maintain we have not, but we have used them a sufficient length of time to allow us to make comparisons with the other filling materials and ascertain if they have a place as a filling material. I have kept a record of fillings inserted during the last ten months and have examined 50 per cent during the past month

or so, and have found that they have stood the test a great deal better than the zinc cements and almost in every case looked as well as when inserted.

One patient, particularly in my mind, for whom, about eight months ago, I inserted silicate and zinc phosphate fillings at same sitting; on a recent examination I found that the zinc phosphate fillings were partially washed out at the approximo-gingival margin, while the silicate fillings were in no way affected. Another case was a patient (a young man of about 17) who visited my office and, on examination, I found eight silicate fillings inserted in his upper anterior teeth, about eight or nine months ago, by Dr. Clark, of Newmarket, and the fillings appeared in as good condition as the day inserted. He seemed very much pleased at the satisfaction they were giving him, as he said he had them previously filled with zinc phosphate cement, which did not last very long. Where due care and discretion is made in the choice of cavities, as well as age and temperament of patient, the silicate cement (when directions are closely followed) is to my mind preferable as compared with zinc cements.

I have just made my comparison between the silicate and phosphate cements, and I would now ask in how far would the silicate cement take the place of gold? I have heard of a few dentists who took out the gold fillings for a patient and substituted the silicate fillings, the patient giving as a reason her abhorrence of so much gold in the anterior teeth. I consider this a grave mistake, as I do not believe that we have yet a filling that will compare with gold for permanency, where there are like favorable conditions and when properly inserted. But I claim there are cases where the silicate surpasses any other filling material. About four months ago I had a young lady about 20 or 21 years of age (who lately moved to town) visit my office with an abscessed tooth. She had about that time recovered from a serious attack of typhoid fever, she was evidently a bundle of nerves and recited stories (which we all are familiar with) about her trials and tortures at the hands of the dentist under whose care she was where she previously lived, and declared she could not and would not again undergo the tortures of gold filling, and even the dental engine had to be kept in the background as much as possible. I at once thought that if the silicate filling ever had

a place in dentistry this was one. The rubber dam was easily adjusted and the cavities were retentive, a few of the cavities being previously filled with gold. I filled with the silicate filling and so far appear to be giving good satisfaction and were inserted with but little discomfort to the patient.

They are also indicated in cavities near the labio-gingival margin, where we find it sometimes so difficult to force the rubber dam in place, and where the decay reaches well under the gum margin. I inserted, about seven months ago, for a little girl about 14 years of age, two such fillings in the upper centrals, labio-gingival margins. I kept the cavity dry with absorbent cotton and punk, and also adrenalin chlorid. On examination a few days ago I found it as perfect as when inserted. I am convinced that phosphate cement would not wear as well, and the hypersensitive condition of the dentin, as well as the difficulty there would be in getting the rubber dam in place, would not permit gold to be inserted. Another case that would indicate a silicate filling is that of boys and girls ranging from the age of 8 to 16 years of age. We all realize that children have not reached the age when they know the necessity of having good work done. About the only thing the child is thinking about is as to whether it is going to hurt or not. You want to retain the respect and love of the child, and to have him continue as your patient during life. If you torture that child for an hour or more every day for a week, what is the result? The child will have such a dread of the dentist that you will never again get it into the dental chair.

There are cases where plastics are indicated. I remember reading a strong plea made by Dr. Ottolengui to fill all children's teeth with gold, but in the discussion which followed the reading of his paper, a storm of opposition and dissent ensued; and very little sympathy was given him in the position he had taken. I do not believe that it is advisable to insert gold if the pain or nervous stress of insertion will be greater loss than the difference between the services of a plastic or gold filling. I believe the best results are obtained by inserting amalgam in the posterior teeth, and phosphate and silicate cements in the anterior teeth.

Dr. W. D. Miller of Berlin says: "Supposing the tooth to

be fully developed and of good structure, and supposing that the patient has the necessary power of endurance and that the teeth are not so crowded as to render it difficult to obtain the necessary space, without undue wedging, I do not see any particular contra-indication against filling teeth of young persons with gold. I have seen cases, however, where the teeth could be carried over the period of greatest activity of caries better by cement than by gold." I do not consider it wise to use a gold filling for a young patient, where the cavity is so very large that the malleting of the gold will cause pericemental irritation sufficient to injure the tooth. Again, in many young patients, the decay has approached so near the pulp that there may be some doubt about it remaining alive; in such cases cements should be used.

Silicate cements would be indicated in cases of teeth with chains of deep pits on labial surfaces. Instead of sacrificing those teeth by excision and crowning, the silicate filling appears to clear up the defects and a detection of the repair is not possible. Another place in dentistry for a silicate filling is in repairing facings in crown and bridge work. I had a lady come into my office wanting me to repair a bicuspid facing on a piece of bridge work of five teeth. The bridge was solid on abutments and not easily removed. I got anchorage under the laps of the gold and added to this retention with engine and bur; this retention, together with the pins, I found sufficient to retain the filling. I filled in with Ascher's cement and followed the general direction in mixing and filling and the effect was very satisfactory. Permanent work would depend a great deal on the anchorage secured, as well as the mixing and manipulation, and keeping dry before and after insertion.

I may say that I am not an histologist, and consequently felt that instead of coming here and giving you my humble opinion on the status and relations of the different filling materials, I would reserve my own views and base expressions thereon entirely on the clinical aspect of the cases as I have seen them.

A few words about the preparation of the cavity, as well as the mixing and insertion of filling.

The cavity for a silicate filling should have an undercut, or

retaining point. The edges of cavity ought not to be bevelled as for gold, but with sharp edges as for porcelain inlays. I do not believe it advisable to build up a corner with a silicate filling, although Dr. Tuller, of Chicago, says he has successfully done so. The rubber dam should be used where possible. After the cavity is prepared, and previous to the insertion of filling, dry carefully with hot air. I believe one of the principal requirements to insure success with the silicate, as well as all cements, is the attention that should be paid to the mixing. Mix with bone spatula and have your glass slab clean. Each portion of powder should be rubbed and spatulated, using a good deal of pressure. Care must be taken not to mix too dry and not to add powder when it gets to a stiff consistency, as it is impossible to incorporate it, and the result would be that it would flake and disintegrate and prove to be very unsatisfactory. When it sets to that consistency that it sticks readily when touched to the glass slab it is ready for insertion into the cavity. Press the material well against the sides of cavity by means of a nickel or clean polished instrument; in that way to prevent discoloration of filling. I would leave for about thirty minutes before finishing. When sufficiently hard for polishing I would first cut down surplus with chisels or spatula and finish to required shape with cuttlefish disks greased with vaseline.

I have heard of a certain dentist who prepared ten cavities before inserting a filling. Comfort to the patient, as well as a saving of time, is the result of filling immediately after preparation of one or two.

The smooth, glossy surface contrasts strongly with the dead-like surface appearance of the zinc phosphates, thus indicating greater solidity and, therefore, resistance to attrition and infiltration. When the above directions are carried out a failure is seldom made, and a filling far superior to the phosphate cement filling is obtained, and the silicate filling will have its own place in dentistry until we get something better to take its place.—*Dominion Dental Journal.*

THE PRESENT STATUS OF THE ARTICULATION QUESTION. By George B. Snow, D.D.S., Buffalo, N. Y. Artificial dentures must, in their construction, be regarded from two

standpoints: the esthetic and the mechanical. First, teeth must be selected of the correct size, shape and color to correspond with the age, temperament and complexion of the patient, and they must be so arranged that they will contribute their share towards giving a pleasant expression to the features. Secondly, the lingual surface of the upper plate must be so shaped that the sounds necessary for speech will be easily and correctly produced. Thirdly, the plates must have all possible stability in the mouth, so that they may not be easily dislodged. This latter condition involves two considerations; the fit of the plates upon the alveolar ridges and the palate, and the correct arrangement of the teeth; so that the plates will not be displaced by the contact of the teeth of one set upon those of the other. The latter consideration, the correct arrangement of the teeth for the performance of the function of mastication, will be the subject discussed at this time; and it will be limited to full upper and lower dentures.

The first step in the discussion of the matter will be a statement of the functions of the temporo-mandibular articulation, or the attachment of the lower jaw to the skull. The mandible, or lower jaw, is well known as a U-shaped bone, consisting of a body, in which the teeth are inserted, a ramus, or ascending portion, on either side, and at the top of either ramus and at the extreme rear, a condyle, or articulating surface, which forms the joint by which it is attached to the skull. The limits of this paper do not permit a rehearsal of the anatomy of the joint. It is a complicated one, and should be better understood by dentists than it usually is. Suffice it to say that either condyle is capable not only of a hinge-like motion in its socket, but also of a forward movement. When both condyles move forward, the mandible is protruded. If one condyle moves forward, the jaw turns upon the other joint as a pivot, and it then has a lateral swing. This gives the lower teeth a lateral movement upon the upper ones, which is useful in mastication for the grinding and comminution of the food. A regular, well-articulated set of natural teeth will be capable of contact at numerous points, not only in occlusion, but also when the mandible is moved laterally; the points of contact being, in this case as in the other, upon both sides of the mouth. As the glenoid fossæ, in which the condyles are received, are notches, the condyles in moving forward

have a certain amount of downward movement, as they pass forward upon prominences which have the name of the eminentiæ articularis. The amount of inclination of this movement depends upon the depth of the glenoid fossæ and the prominence of the eminentiæ articularis, and varies, not only in different persons, but often in the two joints of the same mandible.

These circumstances affect the articulation of the teeth. Examination of a skull will show that the articulating surfaces of the teeth do not lay in a plane, but curve, which is usually called the compensating curve. The bicuspids are at the lowest point, and as it passed to the rear, the curve rises. And if it were continued, it would, in many cases, touch the condyle. In such a case the curve may be considered as a segment of a circle; as circular objects are the only ones which will move upon a concave supporting bed, and remain in contact with it at all points. And the condyle path will then be another segment of the same circle; for if it were any other line, it would throw the first segment out of contact with its supporting bed, the opposite set of teeth. If the curve is a flatter one, which would pass behind the condyle when produced, the simile will hold good, for the condyle path would then be a segment of another circle struck from the same center.

The convexity of the upper set of teeth is apparent, not only in the compensating curve, from front to rear, but laterally; the inner cusps being longer than the outer ones, while in the lower set the condition is reversed. There is thus a decided concavity in the articulating surface of the lower set, and a corresponding convexity to the articulating surface of the upper set. And the amount of this convexity also depends upon the depth of the glenoid fossæ and the prominence of the eminentiæ articularis.

In the matter of the movements of one set of teeth upon the other—when the mandible is moved laterally and the teeth are allowed to slide, one set upon the other, their movements are not the same on both sides. Upon the side where the condyle moves forward, the lower teeth move forward, nearly in line with the side of the alveolar arch. And by means of the compensating curve they are able to remain in contact, notwithstanding the obliquely downward movement of the mandible. On the other side, where the condyle turns as a pivot, the movement of the lower molars

and bicuspids is almost directly across that side of the upper alveolar arch. It will be seen that this cross movement is the more favorable of the two for grinding the food; and that the condyle, being in its fossa, is better able to support the force exerted by the temporal and masseter muscles upon the mandible.

When it becomes necessary to replace the natural teeth by artificial ones, these facts must be remembered, and these conditions imitated to insure success.

But this is sometimes denied. Dentists who ought to have known better, but whose powers for observation must have been very poor, have maintained that the only movement of the mandible which was used in mastication was the hinge-like movement. It is only necessary, though, to see almost any person having a good set of natural teeth when in the act of eating to disprove such an assertion. The movements are also seen in some animals. A horse, eating grass or grain, or a cow chewing her cud, exhibit them more obviously than does a human being.

To so arrange a full artificial denture that it will have good occlusion, and also good articulation, has not been so easy a matter. That is, to so arrange the teeth that, no matter how the two plates are brought together, the teeth will be in contact at a number of points on both sides of the mouth.

A dentist who had considerable experience in prosthetic dentistry, and who also had the virtue of being candid, was accustomed to say that the production of a full upper and lower denture which was entirely satisfactory, and could be counted as a success, was a matter of sheer luck. The remark was true when the common articulator was used in its construction.

In order to be successful, a full upper and lower denture must not only have good occlusion, or proper contact of the teeth when the mandible is retracted and central, but it must also have a good articulation. That is, there must be the capability of contact of the teeth of the two sets at several points on each side of the mouth when the mandible is moved forward, or laterally, as in mastication. When this obtains, the upper plate will be pressed upwards into contact with the ridge upon both sides, and so it will not be dislodged. This condition can only be obtained, first, when an articulator is used which duplicates the conditions existing in

the temporo-mandibular articulations of the patient. And as these conditions vary, as has already been shown, the articulator joints must be capable of adjustment to meet the varying conditions.

Second, the models must be so placed in the articulator that they are in the same relations to its joints that the alveolar ridges, which they represent, are to the temporo-mandibular articulations of the patient. This condition is not so important as the first one, but it is imperative if any change is to be made in the vertical separation of the models (opening or closing the bite), after the models are set in the articulator. Almost all the articulators now in use are too long in the jaws, and will not permit the models to be set closely enough to the joints; and, as a consequence, whenever the bite is opened, the teeth will require readjustment in the mouth, or, if the plates are taken directly from the articulator and finished, the second molars will be the only teeth which will come together when the plates are in the mouth, if the bite has been opened, or they will be separated if the bite has ben closd.

Third, there must be means provided whereby the adjustments, both of the articulator joints and of the models in the articulator, may be easily and quickly made.

It is apparent that these are propositions involving the most ordinary mechanical principles. It is only necessary to state them clearly, and their truth is self-evident. And it is apparent that if they can be carried out successfully the guesswork which is the main cause of the mishaps in the branch of prosthetic dentistry in question can be easily eliminated, and a character of work produced which will add greatly to the comfort of our patients.

Is it any wonder that there are failures in the construction of full upper and lower dentures, under the usual conditions? The common articulator, used to-day more than any other, has only a hinge-like motion, and although the teeth may be arranged to show good occlusion, it is an utter impossibility to know how they will meet when they are in the mouth, and a lateral movement of the mandible is made. Any attempt to meet such conditions must be guessed at. When the models are placed in the articulator, their positions, in relation to its joint, are guessed at. If an attempt is made to introduce the compensating curve, its amount, which depends upon the direction of the condyle path, which is

unknown, must be guessed at, both as to convexity and direction. And when the dentist has finished this conglomeration of guesswork, and placed it in the patient's mouth, the ability of the patient to use the plates successfully and satisfactorily is also a subject for guesswork. The defects of the ordinary methods for articulating full dentures have been recognized, and efforts have been made to overcome them. The first of the permanent teeth to make their appearance are the central incisors and the first molars. The latter are erupted immediately behind the second deciduous molars and they are arrested in their eruption when they meet their antagonists. These teeth do not meet squarely upon one another, the lower molar being a little in advance of the upper one, so that it is over-

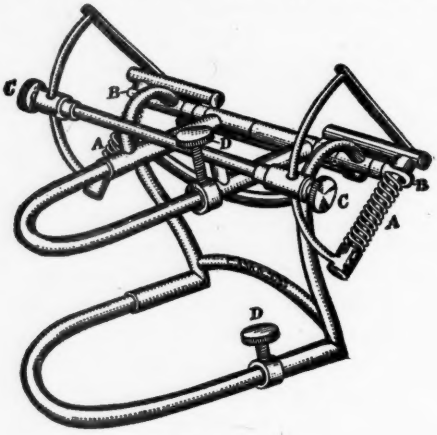


FIG. 7

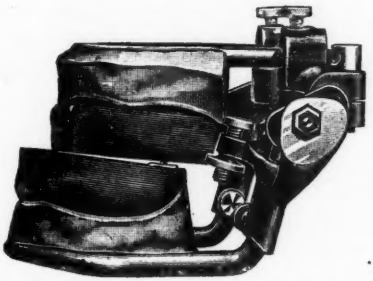
hung by its distal third. The next teeth to be erupted are the bicuspids. These are again arrested in their eruption by contact with the opposing teeth, and they take their positions by contact of the inclined surfaces of their cusps and the lateral pressure which they consequently receive from their opponents. Then the lower second molar is erupted, and it comes into contact with the distal portion of the grinding surface of the upper first molar. This determines its position. This is followed by the upper second molar, which is again arrested in its progress by contact with the distal portion of the lower second molar. Then follows the eruption of

the third molars. The result, in a normal dentition, is that these teeth come into contact, not only in occlusion, but also when the mandible executes the lateral movements incident to the function of mastication, their grinding surfaces forming the "compensating

FIG. 8

curves," the amount of curvature being dependent upon the prominence of the eminentiæ articularis.

A full upper and lower denture should, if correctly constructed, duplicate the conditions found in Nature. That is, there should be numerous and widely distributed points of contact between the two sets of teeth, so that when the movements incident to mastication are performed, the two sets will be held in place, and there will



be no tipping of the plates upon the alveolar ridges. In setting up the teeth, this condition is more easily arrived at, if the process of eruption of the natural teeth is kept in mind and imitated. The appearance of the plate in the mouth and its harmony with the features depends almost entirely upon the arrangement of the upper

incisors, cuspids and bicuspids, and it is always advisable to try the upper plate in the mouth of the patient after these teeth have been arranged and before proceeding further. When assurance is had that these teeth are correctly set, the lower second bicuspids are next mounted so that their cusps come into the interspace between the upper bicuspids. The lower first molars follow, their height being gauged by the overhanging distal surface of the upper second bicuspids; and their positions are tested by lateral movements of the articulator, and they are set so that they will maintain contact, but not interfere with that of the bicuspids. Then the upper first molars are added, and their positions tested in the same manner. After these come the lower second molars and the corresponding upper teeth. When they are all mounted, they should all remain in contact during lateral movements of the articulator.

The lower first bicuspid, coming as it does between the upper first bicuspid and cuspid, is free upon the mesial side of its grinding surface. The cuspids and incisors, being added in pairs, should be kept out of the way of the articulation of the molars. If they should be too wide to fill the space, they should be exchanged for narrower ones. The teeth already set should on no account be moved backward to accommodate them. Frequently the cusps of the teeth require grinding before they will articulate as they should, and when the need for it is apparent, there should be no hesitation about applying the carborundum wheel. When a correct articulation is thus secured, and the denture is finished, it will be found to be one from which the patient can derive all possible benefit so far as the performance of mastication is concerned.

This matter has passed the theoretical stage. A number of dentists have adopted the principles here laid down in practice with the best results. And it may be said that their understanding and adoption will enable those who use them to do better service to their patients than has heretofore been possible.—*Dentist's Magazine.*

PROPHYLAXIS AS RELATED TO ORTHODONTIA. By Dr. H. C. Ferris. This theme, while old, seems to have been overlooked in the rapid development of this specialty, or else writers have considered that men sufficiently intelligent to undertake its

practice, would use ordinary precautions. However, I make bold to present this subject for your consideration.

Our field of operation is one of low vitality, owing to perverted nature, caused by nasal obstruction in a large percentage of the cases, making mouth breathing a necessity; producing an abnormal development of the mucous tissue of the oral cavity, and air passages. The antiseptic qualities of the nasal mucoid secretions having been lost, the air passes through the mouth and the lungs are laden with bacteria owing to this abnormal action. The hypertrophy of the faucial and pharyngeal tonsils render them more susceptible to the attacks of all the animal and vegetable bacteria that are found in nature.

The physical condition of these patients due to this abnormal functioning, renders their system less able to resist attacks of bacteria, such as the diplococcus of pneumonia, bacillus of diphtheria, etc.

The accumulation of carbohydrates and proteid substances after each meal form the best food for nourishment of oral bacteria by clinging to the metallic appliances both stationary and removable, and are with difficulty removed with most careful mechanical means. In most mouths the characteristic fermentation occurs after each meal without such appliances; therefore, with them and their accumulating tendencies, this action is proportionately increased. The formation of carbohydrates is accompanied by the production of certain acids of which lactic acid is the chief.

The decomposition of albuminoids results in alkaline reaction. When two are mixed they produce a mild acid reaction, depending to a degree on a particular form of bacteria acting upon the mass, and partly to the nature of the food and the percentage of the carbohydrates in it. According to the percentage of excess of lactic acid formed during the fermentative action of certain oral bacteria on the carbohydrates in the mouth, we find the pathological conditions of the mucous surfaces increased, as a hyper-acid condition of the oral secretions proves to be one of the irritating causes of disease of these tissues, lowering their functioning ability and thereby rendering them more vulnerable to any form of microorganisms.

Can we afford in our effort to assist nature to establish a normal

occlusion, to neglect our hygienic precautions during this process, by placing materials in the oral cavity which increase the surface for accumulation and culture of these organisms, without endeavoring, with the means we have at hand, to reduce the quantity of their reproduction? By bacteriological experiments we learn of the rapid growth of these organisms in the oral cavity, and we find by clinical experience, that the teeth and appliances are rapidly covered with oleaginous substances which become a favorable medium for their culture.

The antiseptic qualities of the copper used in some of these, we appreciate, but we know that colloidal copper which produces this antiseptic action is only given off while the metal is polished and free from albuminoid deposits. So when wires containing this metal are not submerged under the gum tissue, this antiseptic action is soon lost; therefore, we must look to other means for cleansing these surfaces.

Again in the adjustment of wire ligatures, even in the most skillful hands, the operator is apt to puncture the mucous tissue, and as these wires presented to us by the trade are found to be bacteriologically unclean, we are liable to infect this suceptible subject.

We have a few cases on record, one of which was reported to the Second District Dental Society of the State of New York, of tuberculosis in its most virulent form, from the use of a septic dental scaler, which resulted in the death of the patient. The difficulty of tracing these infections to the hands of the dentist, is the reason for fewer reports of this character. Simple methods in technique can, to a large extent, control such infections.

If, on the contrary, we find that the wires furnished us by the dental supply houses are steriles, they are liable to be infected by handling. The composition put on the market by Dr. E. H. Angle, will frequently give negative bacteriological results, as tube No. 1 will prove. (Demonstrating.)

This bouillon tube was infected by a wire of this make and kept in an incubator in Seney Hospital laboratory under the care of Dr. Dexter, pathologist, and was accompanied by tube No. 2, which contained some of the same bouillon, which was infected with serum from a septic wound, and was introduced into the incubator at the

same time as tube No. 1, and developed the culture you see in half the time. This single experiment does not prove these wires all sterile when they reach our hands, and the method of sterilization is so simple that we should run no risk.

Sterilization of Ligature Wires.—By introducing a bundle of wires into a U-shaped glass tube, we may sterilize the contents either by boiling in a saturated solution of sodium carbonate for twenty minutes, introducing a small cork, and allowing them to remain in the solution; or by exposing them to the action of formaldehyd gas for eight hours; or by allowing them to remain in a colloidal copper solution for one hour; or by sterilizing with dry heat. By any of these methods we may be reasonably sure we have a sterile product. Each method has its advantages and disadvantages. The preference would be given to that of boiling, as it does not require repetition, the solution protecting the wires from oxidation and from re-infection from the air and hands.

Mouth Sterilization.—Our field of operation is the most septic of any cavity in the body, therefore the first step in the technique should be to render the field aseptic.

We first mechanically cleanse the teeth with frictional material as thoroughly as possible, then spray the parts with antiseptic solutions under high pressure, which will destroy the bacteria present. We have numerous antiseptic agents of varying value, from which we may select one sufficiently powerful to meet the case. The most cleanly patients naturally present the most healthy tissues; but their susceptibility to infection, owing to the general condition, must be taken into consideration.

To prove this necessity, a wire that had been worn three weeks without prophylactic care was taken from a mouth. It was gently scraped with a sterile platinum loop by the pathologist; the wire was placed in one bouillon tube and the scrapings in another. The former developed no culture, evidently proving the antiseptic qualities of the composition, as the surface was enabled to give off colloidal copper. The latter was used to infect another tube which produced a culture. A microscopical slide developed the presence of bacilli, diplococci and micrococci.

There are solutions that are largely alkaline with very little antiseptic value; but the patient's sense of taste must not be considered

to their detriment. The solutions which are sufficiently strong in antiseptic value, are not particluarly pleasant; but if our efforts be sincere, they must be thorough. There are two drugs which are accepted by our authorities, which we may employ. The first may be used in mild conditions, and consists of:

℞ Trikresol .....m. xxx
Oil of Cassia .....m. xx
Aq. dis. ad. q. s. .....oz. iv

M. Sig. To be used in spray at a temperature of 105 degrees F.

The active principal of this solution is the trikresol, the oil of cassia being used to disguise the disagreeable taste. The former is a clear watery liquid, having three times the disinfecting value of phenol, while it is three times less poisonous and less caustic, and is composed of orthocresol 35 per cent, metacresol 40 per cent and paracresol 25 per cent. In bacteriological experiments undertaken by Major Walter Reed, Curator of the Army Medical Museum in Washington, he found that a 1 per cent solution of it accomplished as much as a 4 per cent or 5 per cent solution of phenol. It is particularly valuable for our purpose, as it is active in fluids rich in albumen; being neutral in reaction it leaves the metallic surfaces bright. It is also readily soluble in aqueous solutions.

In acute conditions, when we require a stronger antiseptic, we may use a solution composed of:

℞ Iodin .....m. xix
Potassium Iodid .....m. xix
Aq. dist. ad, q. s. .....oz. iv

M. Sig. To be used in spray under high pressure at a temperature of 98 degrees F.

The antiseptic value of iodin has been recognized for centuries. This agent in its powdered form, iodoform and aristol, is a standard in our hospitals. It possesses a quality which produces the destruction of a capsule of the spores that bichlorid of mercury does not possess. It has been recently found that the solution of this drug becomes more potent when potassium iodid is combined with it, increasing its solubility. The American Pharmacopœia, of 1906, directs the addition of potassium iodid to all tinctures of this drug. The solution here recommended, when sprayed in the oral

cavity, will fix the plaques of bacteria so they may be detected upon the surfaces of the teeth as well as on the appliances. In order to remove these plaques a mixture of

℞ Starch .....dr. iii
Aq. dist. ad. q. s. .....oz. iv

will convert the iodin into an iodid of starch; which is more readily washed off the surfaces with a solution of

℞ Sodium Carbonate .....gr. xviii
Oil of Gaultheria.....m. xxx
Aq. dist. ad. q. s. .....oz. iv

M. Sig. To be used in temperature of 115 dgerees F.

This last solution also tends to free the surfaces of oleaginous matter.

After this treatment we can be reasonably sure that we are working on sterile tissue, and the liability of infecting our patients is reduced to a minimum.

Sterilization of Hands and Instruments.—The necessity for sterilizing our hands, using a sterile brush with green soap, and immersing them in an antiseptic solution, preferably 3 per cent camphenol, which should stand in a bowl within reach of the operator for freeing his hands of mucus during his work; the boiling of pliers, scissors, mouth mirrors and carriers, between patients, are precautions that no intelligent operator can neglect. Instruments such as lances, scalpels, etc., may be boiled for twenty minutes in glass tubes in a saturated solution of sodium carbonate, and placed in the cabinet ready for use at any time.

The prophylactic treatment at each visit, once a week, requires but fifteen minutes, and the results are remarkably satisfactory. The patient is directed to be particularly careful in cleansing the mouth, and is given a solution as follows:

℞ Hydronapthol .....
Menthol .....aa gr. xxx
Oil of Gaultheria .....
Oil of Cassia .....aa m. iv
Sp. Vin. Rect .....oz. x
Tinct. Capsicum .....dr. x
Aq. dist. ad. q. s. .....oz. xx

M. Sig. Teaspoonful to half glass hot water.

This should be used twice daily, morning and night, and in acute

conditions, five times daily, holding the same in the mouth for three minutes. A mouth thus cared for, will show little, if any, inflammation even in the presence of irritation, and the operator may feel that he has done all in his power to protect his patient. Tube No. 6 is a bouillon solution in which is a ligature wire which had been worn in the mouth for one week under this prophylactic treatment. It was gently scraped with a sterile platinum loop by the pathologist, the wire being placed in one bouillon tube and the scrapings in another, and at the end of three days developed a negative result.—*Items of Interest.*

BURNISHED JOINT FOR PORCELAIN CROWNS.—So many suggestions have been made in the matter of securing a perfect joint in setting the porcelain crown that it would seem that the ingenuity of man has been exhausted; most of the plans, however, have contemplated grinding the porcelain directly to the end of the root. The physical impossibility of making a perfect joint in the mouth led me to adopt the following plan, which seems to secure the desired result. In setting the detached Logan or Davis crown, prepare the root in the usual way; after the root has been reamed out, place the pin in position and try on the tooth to get the alignment; if necessary, bend the pin; remove the pin and cut a piece of fine gold plate 36 gauge, large enough to more than cover the end of the root. With the plate punch, punch a hole in the center of the plate; replace over the root and force a pin through the hole to position in the root; then burnish gold over the edge of the root until the gold shows a well defined mark made by the root edge; trim the gold carefully to this mark, replace and burnish gold perfectly to the entire end of the root, dressing off the edge of gold at any point it may extend slightly beyond the edge of the root. When this is accomplished, with the pin and gold plate in position, fill the space with soft salted plaster, allowing the plaster to extend over the teeth on each side of the space, and while the plaster is still soft direct the patient to close the teeth and keep them in this position until the plaster has set, thus securing the bite. Remove the plaster (if it breaks save the pieces), which will bring the pin and gold plate away with it; run the model, which will show the tooth in each side of the spaee; place in the articulator and run the cast, showing the opposing teeth. We thus have the pin, gold plate and teeth each side of the space, together with the occluding teeth, in plaster. The porcelain may then be ground to fit the gold plate and articulate very satisfactorily. When ground to position, cement the crown to place; after the cement has set remove the plaster, and the operator has a crown ready to set with a burnished joint between the root and tooth, the gold being so thin that it is quite imperceptible, and a joint as perfect as can be made for any inlay.—DR. D. T. HILL, *Dental Brief.*

The Dental Digest.

PUBLISHED THE LAST WEEK OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

IS THE DENTAL PROFESSION DOING AS WELL AS IT COULD DO?

This question was raised in connection with some others of like importance growing out of a paper on the college question read at the last meeting of the Illinois State Dental Society. In the first place are there too many dentists in proportion to population? It is a well-known fact that a great many of the community in this country and much more so in Europe do not employ the services of a dentist as much as they should, if at all. One of the greatest reasons or causes for this is, of course, a financial one; the inability, as well as the indisposition, to pay for the care of the teeth. There is, however, still another reason—namely, a lack of knowledge of the importance of having the teeth cared for early and regularly.

We believe that if the community were better informed on this subject the services of the dentist would be in much greater demand. But, it is asked, how is the community to be educated? There are public movements on foot in some states and cities as the result of which the mouths of school children are to be examined frequently and at stated periods. The plan is, as yet, too new to allow the forming of any idea as to what the results of these examinations will be in so far as increasing the demand for dental services is concerned, even though such examinations become general.

From time to time committees have been appointed to issue addresses and circulate printed matter among different communities relative to this subject of the care of the dental organs. Thus far nothing very tangible has resulted from these plans, although both

methods are good if they could be followed systematically and persistently.

There is, however, a means of keeping this subject and its importance before every community—namely, through the personal contact of every dentist. Our chosen profession of dentistry is not one that should be administered by a species of automaton service. It is in reality one that should exact from every practitioner painstaking care and that ready sympathy and interest in every patient and his welfare that cannot fail to call forth his approving commendation of the service rendered to those among whom he moves. It has often seemed to us in thinking of this that the dentist is frequently negligent and much too indifferent to the needs of his patients, and this indifference has its influence on patients so that they become careless as to their own needs.

We have in a number of instances personally known a practitioner to lose a very large portion of his clientele by becoming careless, moody or indifferent, the influence of his condition reacting upon his patients to the extent that they left him and went to others for dental services. We emphasize the power of this influence with a strong belief that there is much more to it than is generally understood.

It is a rare thing to find the teeth of a patient in perfect condition, and this fact should be impressed upon every one coming into our hands and in such a way that they would not only attend to their own personal interests in this respect but be a means of informing their relatives and friends also, for in this way a far larger number of the community would seek the services of a dentist. If every dentist realized this interest, that could be so easily aroused on the part of his patients, and served them with the care that he should the present lamentable condition of the dental profession financially would be changed, as it certainly ought to be. For practitioners of dentistry to be owing for their legitimate obligations is in itself demoralizing to any man who has fine enough sensibilities to be fit to practice dentistry, and it is, therefore, one of the most serious problems in connection with the practice of dentistry to-day. We pen this editorial at this time with the hope of arousing a deeper interest and more earnestness on the part of dental practitioners generally.

Notices.

NORTHERN INDIANA DENTAL SOCIETY.

The nineteenth annual meeting of the Northern Indiana Dental Society will be held at Peru, Sept. 17 and 18. The Northern Indiana is noted for its good meetings and this one promises to be even stronger than heretofore. W. R. MEEKER, Secy., Peru, Ind.

NEW BRUNSWICK DENTAL ASSOCIATION.

The annual meeting of the New Brunswick Dental Association was held at Moncton, July 9, 1907, the following officers being elected: President, F. A. Taylor, Moncton; Vice-President, Dr. Daley, Sussex; Secretary, Dr. Godsoe, St. John. The next meeting will be held at St. John.

SIXTH CONGRESSIONAL DISTRICT (LA.) DENTAL ASSOCIATION.

The Sixth Congressional District Dental Association was permanently organized at Baton Rouge, La., July 4, 1907, and the following officers elected: President, H. J. Feltus, Baton Rouge; Vice-President, R. E. Nettles, Denham Springs; Secretary and Treasurer, M. F. Bloomenstiel, Baton Rouge.

NORTHEASTERN DENTAL ASSOCIATION.

The thirteenth annual meeting of the Northeastern Dental Association will be held in the city of Portland, Maine, Hotel Lafayette, Oct. 16, 17 and 18, 1907. Preparations are being made for a valuable and instructive meeting. EDGAR O. KINSMAN, D.M.D., Secy., Cambridge, Mass.

HARVARD DENTAL ALUMNI ASSOCIATION OF MASSACHUSETTS.

At the thirty-sixth annual meeting of the Harvard Dental Alumni Association of Massachusetts, held June 24, 1907, in Boston, the following officers were elected: President, Harry W. Hardy, Boston; Vice-President, Lyman F. Bigelow, Boston; Secretary, Waldo E. Boardman, Boston; Treasurer, Harold De W. Cross, Boston. Executive Committee—David F. Spinney, Brookline; William W. Marvel, Fall River.

BARRY COUNTY (MICH.) DENTAL SOCIETY.

The Barry County Dental Society was formed May 3, 1907, and the following officers elected: Dr. J. C. Andrews, President, Hastings, Mich.; Dr. F. Carrothers, Secretary-Treasurer, Hastings, Mich. The society will hold a meeting some time in July, date and place to be decided later.

F. CAROTHERS, Secy., Hastings, Mich.

JOINT MEETING OF THE THIRD, FOURTH AND FIFTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

There will be a joint meeting of the Third, Fourth and Fifth District Dental Societies of the State of New York, to be held in Schenectady, N. Y., Oct. 15 and 16, 1907, at Red Men's Hall.

A. S. MOORE, Secy. of Fourth Dist. Society,
159 Jay St., Schenectady, N. Y.

MAINE DENTAL SOCIETY.

The forty-second annual meeting of the Maine Dental Society was held July 16, 17 and 18, 1907, in Rockland, the following officers being elected for the ensuing year: President, W. S. Miller, Fairfield; Vice-President, W. R. Bibber, Eastport; Secretary, H. A. Kelley, Portland; Treasurer, E. J. Roberts, Augusta; Librarian, Dana W. Fellows, Portland. Executive Committee—C. H. Mead, Bangor; E. C. Blanchard, Portland; J. P. Lancaster, Madison; E. L. Hall, Augusta; I. E. Pendleton, Lewiston.

WISCONSIN STATE DENTAL SOCIETY.

The annual meeting of the Wisconsin State Dental Society for the transaction of formal business was held at La Crosse, July 16, 1907. The regular convention was postponed on account of the national convention which meets in Minneapolis, July 30. William H. Cudworth of Milwaukee was elected president and Harry Jackson of Milwaukee, secretary. The next convention will be held in La Crosse.

NEW HAMPSHIRE DENTAL SOCIETY.

The thirteenth annual meeting of the New Hampshire Dental Society was held June 25, 26 and 27, 1907, in Plymouth, and the following officers were elected: President, John H. Worthen, Concord; Vice-President, Z. P. Shaw, Claremont; Secretary, Fred F. Fisher; Treasurer, William A. Young, Concord; Librarian, H. C. Goodwin, Manchester. Executive Committee—H. P. Baldwin, Manchester; A. W. Wark, Lancaster; A. C. Foster, Rochester.

NORTH CAROLINA MEDICO-DENTAL AND PHARMACEUTICAL ASSOCIATION.

The seventeenth annual meeting of the North Carolina Medico-Dental and Pharmaceutical Association was held in Greensboro, June 22, 1907, and the following officers were elected for the ensuing year: President, C. H. Shepard, Durham; Secretary-Treasurer, A. O. Wyche, Charlotte; First Vice-President, W. T. Pickett, Charlotte; Second Vice-President, M. T. Pope, Raleigh; Corresponding Secretary, W. O. Jones, Winston. Executive Committee—J. M. Jones, Winston; H. H. Hall, Winston; P. H. Williams, Raleigh.

SOUTH CAROLINA DENTAL ASSOCIATION.

At the thirty-seventh annual convention of the South Carolina Dental Association held in Anderson, July 2, 3 and 4, 1907, the following officers were elected for the ensuing year: President, T. T. Moore, Jr., Columbia; First Vice-President, E. J. Etheridge, Leesville; Second Vice-President, E. N. Kibler, Prosperity; Corresponding Secretary, W. W. Chisolm, Abbeville; Recording Secretary, R. H. Smith, Charleston; Treasurer, W. S. Brown, Charleston. The next meeting will be held at Columbia.

TENNESSEE DENTAL ASSOCIATION.

The fortieth annual meeting of the Tennessee Dental Association was held July 8, 9 and 10, 1907, at Knoxville, the following officers being elected for the ensuing year: President, C. A. Sevier, Jackson; First Vice-President, John R. Beach, Clarksville; Second Vice-President, C. H. Taylor, Memphis; Recording Secretary, C. A. Tavel, Memphis; Corresponding Secretary, De Lane Kinney, Nashville; Treasurer, S. L. Rich, Nashville. Executive Committee—S. A. Hardison, Columbia; A. J. Cottrell, Knoxville; A. A. McClanahan, Springfield. The next meeting will be held at Nashville.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society held its thirty-ninth annual convention at Pittsburg, July 9, 10 and 11, 1907. The following officers were elected: President, P. K. Filbert, Pottsville; First Vice-President, C. B. Bratt, Alleghany; Second Vice-President, W. D. DeLong, Reading; Recording Secretary, L. M. Weaver, Philadelphia; Corresponding Secretary, V. S. Jones, Bethlehem; Treasurer, W. A. Spencer, Carbondale. Executive Council—C. C. Taggart, Pittsburg; J. T. Lippincott, Philadelphia; E. J. Donnegan, Scranton. Board of Censors—C. C. Walker, Williamsport; E. W. Bohn, Reading; W. H. Fundenburg, Pittsburg; C. C. Taggart, Pittsburg; J. G. Lane, Philadelphia. The next meeting will be held at Philadelphia.

RESOLUTIONS ON THE RETIREMENT OF DR. L. C. TAYLOR.

Whereas, Dr. L. C. Taylor has been associated with the College of Dental and Oral Surgery of New York (formerly the New York Dental School) since its inception in 1892 as lecturer on oral prophylaxis and orthodontia; and

Whereas, Dr. L. C. Taylor has determined to sever his connection with the college so that he may lighten his labors and enjoy a well-earned rest; and

Whereas, The board of trustees and faculty realizing the benefit the college has derived from his association, and recognizing that he was unique in his power to impress sound principles of practice upon the pupils who sat under his instruction; therefore, be it

Resolved, That the College of Dental and Oral Surgery of New York

hereby testifies to the loss it has sustained in the retirement of Dr. Taylor, and extends to him its heartfelt appreciation of the work he has accomplished.

Resolved, That these resolutions be spread upon the records of the college and that an engrossed copy be forwarded to Dr. Taylor.

WILLIAM CARR.
CHARLES MILTON FORD.
WORTHINGTON SEATON RUSSELL.
DELANCEY W. WARD.
JOHN I. HART.
R. M. SANGER.

JAMESTOWN DENTAL CONVENTION.

OFFICERS.

Honorary President, Dr. J. Y. Crawford, Nashville, Tenn.; President, Dr. V. E. Turner, Raleigh, N. C.; First Vice-President, Dr. B. Holly Smith, Baltimore, Md.; Secretary-General, Dr. George F. Keesee, Richmond, Va.; Treasurer, Dr. Mark F. Finley, Washington, D. C.

PROGRAM.

Tuesday, Sept. 10, 1907.

9:30 a. m.

Meeting called to order by Dr. Burton Lee Thorpe, St. Louis, Mo., Chairman, Committee on Organization.

Invocation—Rev. Dr. C. L. Bane, pastor Memorial M. E. Church, Norfolk, Va.

Address of welcome—Hon. Harry St. George Tucker, president Jamestown Exposition Company.

Address of welcome—Hon. Claud A. Swanson, Governor of Virginia.

Address of welcome—Dr. Joseph W. Eggleston, Richmond, Va.

Address of welcome—Dr. Edward Eggleston, Richmond, Va., president Virginia State Dental Association.

Address of welcome—Dr. W. G. Mason, Tampa, Fla., president Southern Branch N. D. A.

Address of welcome—Dr. J. Y. Crawford, Nashville, Tenn., in behalf of the profession of the South.

Response to the address of welcome—Dr. J. D. Patterson, Kansas City, Mo.

Address by the president—Dr. V. E. Turner, Raleigh, N. C.

11 a. m.

Lantern Lecture—Prof. W. D. Miller, Berlin, Germany, "Demonstrations of Preparations Relating to the Wasting (so-called erosion) of the Teeth."

Discussion opened by Dr. A. W. Harlan, New York city; Dr. Wilbur F. Litch, Philadelphia, Pa.

2:30 p. m.

Illustrated Lecture—Dr. Charles L. Alexander, Charlotte, N. C., "Gold Inlays."

Discussion opened by Dr. W. H. Taggart, Chicago, Ill.; Dr. H. Herbert Johnson, Macon, Ga.

8 p. m.

Smoker at Inside Inn, Dr. B. Holly Smith, Chairman, Baltimore, Md.

Wednesday, Sept. 11.

9 a. m. to 1 p. m.

Clinics in Convention Hall—Dr. Clarence J. Grieves, Baltimore, Md., Chairman.

2:30 p. m.

Illustrated Paper—Dr. F. T. Van Woert, Brooklyn, N. Y., "Is the Cemented Filling the Filling of the Future?"

Discussion opened by Dr. William K. Slater, Knoxville, Tenn.; Dr. Joseph G. Head, Philadelphia, Pa.

8 p. m.

Convention to be entertained as guests of the profession of Virginia.

Thursday, Sept. 12.

9 a. m. to 1 p. m.

Clinics in Convention Hall.

2:30 p. m.

Illustrated Lecture—Dr. R. Ottolengui, New York city, N. Y., "The Purposes and Accomplishments of Modern Orthodontia."

Discussion opened by Dr. G. Edmond Kells, New Orleans, La.; Dr. Henry W. Morgan, Nashville, Tenn.

Adjournment.

A cordial invitation is extended to all ethical dentists to become members and attend the convention.

All clinics, lectures and meetings of the Jamestown Dental Convention, with the exception of the surgical clinic, will be held in the Convention Hall on the left of the main entrance to the Exposition grounds.

Admittance to this building can be had either from the outside or inside of the grounds.

H. WOOD CAMPBELL,
Secy. Organization Committee.

SURGICAL CLINIC.

The following gentlemen will give surgical clinic at the Jamestown Dental Convention:

Dr. Truman Brophy, Chicago, Ill.
Dr. M. I. Schamberg, New York, N. Y.
Dr. W. J. Roe, Philadelphia, Pa.
Dr. V. P. Blair, St. Louis, Mo.
Dr. W. A. Bryan, Nashivlle, Tenn.
Dr. B. G. Copeland, Birmingham, Ala.
Dr. William T. Nicolson, Atlanta, Ga.
Dr. Fred W. Moorehead, Chicago, Ill.
Dr. Randolph Winslow, Baltimore, Md.
Dr. Schamberg will also give an exhibition of the X-ray for making

diagnosis and a clinic with the X-ray showing its diagnostic value in oral surgery.

These operations will be performed in the operating rooms of the Norfolk Protestant Hospital, where patients will be cared for following the operation.

It is expected that patients will be furnished all operators, as a committee has been appointed in Norfolk and surrounding towns for this purpose.

L. M. COWARDIN, Chairman Surgical Clinic,
407 East Main St., Richmond, Va.

HOTEL ACCOMMODATION.

In view of the statements that have gone out in relation to the lack of accommodation and high hotel charges in the vicinity of the Jamestown Exposition, we, the Virginia members of the Organization Committee of the Jamestown Dental Convention, deem it wise to make a formal statement of the situation that the members of the profession who contemplate attending the convention at the Jamestown Exposition, Norfolk, Va., Sept. 10-12, may not be misled or deterred in their purpose.

While at this time the Exposition is not entirely completed, it presents a very attractive appearance and is well worth seeing, and by the date set for the convention it will not only be fully completed but will be at the very height of its perfection.

Aside from any attraction that is offered by the Exposition, the assembling in Hampton Roads of the fleets of the nations of the world is amply worth the trip to the Jamestown Exposition.

The Jamestown Exposition grounds are not located in any one city, but are nearly equidistant from the tidewater cities of Norfolk, Portsmouth, Newport News, Hampton and Old Point Comfort, and within thirty minutes' ride by rail or water of any one of them.

The hotels and cottages of the summer resorts of Pine Beach, Luckroe Beach, Ocean View, Willoughby Beach, Cape Henry and Virginia Beach will be utilized for the accommodation of visitors.

The suburbs of Norfolk, Portsmouth and Newport News, such as West Norfolk, Port Norfolk, South Norfolk, Berkley, Riverside, River View, Edgewater, Lamberts Point, Parke Place, have many comfortable homes that will be opened to receive guests and are all well connected with electric lines of street railway to points of departure for the Exposition grounds.

We append a list of some of the leading hotels and their rates per day. In order to secure these rates it will be necessary to make reservations not later than Aug. 15.

The Inside Inn, with a capacity of 3,000 persons, will be the official headquarters of the convention. The following are the rates of the Inside Inn:

European plan, without bath, two persons in a room, which includes breakfast, privileges of the Inn, and admission to the grounds, after the guest has registered at the hotel, $2.50 per day, for each person. If room is occupied by only one person, the rate will be $3.50 per day.

American plan, without bath, two persons in a room, which includes

breakfast, privileges of the Inn, luncheon and our $1.00 evening table d'hote dinner with wine, admission to the grounds, after the guest has registered at the hotel, $3.50 per day, for each person. If room is occupied by only one person, the rate is $4.50.

The rates for rooms fronting the sea, or the sea and pine grove:

American plan, if room is occupied by only one person, the rate would be $6.00 per day. If room is occupied by two persons, the rate will be $8.00 for the two persons.

American plan, with bath and toilet, $8.00 per day for one person in a room. If room is occupied by two persons, the rate will be $10.00 for two persons.

The following is a partial list of Norfolk and Portsmouth hotels:

Algonquin Hotel, Granby St. and College Place.....$1.00 per day and up
Atlantic Hotel, Main and Granby Sts..... 1.00 per day and up
Colonial Hotel, 202 Granby St..... 1.00 per day and up
Hotel Fairfax, City Hall Ave. and Randolph St..... 1.50 per day and up
The Monticello, City Hall Ave. and Granby St..... 1.50 per day and up
Gladstone Hotel, Main and Nebraska Streets..... 1.00 per day and up
Haddington Hotel, Granby St. and City Hall Ave..... 1.00 to 3.00 per day
Hotel Savoy, Granby St. and City Hall Ave..... 1.00 to 3.00 per day
Carolina Hotel, Atlantic and Plume Sts..... 1.00 per day and up
St. Denis Hotel, Main St. and Roanoke Ave..... 1.00 per day and up
Terminal Hotel, Plume and Atlantic Sts..... 1.00 per day and up
Henry Seelinger, 39-41 City Hall Ave.
Lynnhaven Hotel, Freemason and Granby Sts..... 2.00 per day and up
Union Hotel, 35 Brewer St..... .50 per day and up

Stag Hotels.

The Lee Stag Hotel, 97 Bank St.....$1.00 per day and up
McDonald's, Main St. and Commercial Place..... 1.00 per day and up
Victoria, 359-361 Main St..... 1.50 per day and up
Henry Seelinger, 39-41 City Hall Ave.

Portsmouth.

Hotel Monroe, Court and High Sts.....$1.00 per day and up
Hotel Fairfax, Crawford and High Sts..... 1.00 per day and up
Pearson Hotel, High and Water St..... 1.25 per day and up

In addition to the hotels named above, there are hundreds of private boarding houses and rooming houses, at which visitors may secure accommodations at reasonable rates.

We will thank you very much to give the above information as wide publicity as you can through your esteemed journal.

Yours very truly,

R. H. WALKER, Norfolk, Va.,
F. W. STIFF, Richmond, Va.
H. W. CAMPBELL, Secretary.

Organization Committee.

TRANSPORTATION.

The following rates to the Exposition have been made by the transportation lines:

Season tickets, 80 per cent of double one way.

Sixty-day ticket, one and one-third fare, plus 25 cents.

Ten-day ticket, one and one-third fare, plus $2.25.

These rates will probably be lessened, or, if not, there are likely to be special excursions from all parts of the country and Canada at low rates.

The following places of interest can be visited as side trips:

Jamestown Island, $1.00; Yorktown, $1.00; Williamsburg, $1.95; Washington, $3.50; Baltimore, $5.00; New York, Old Dominion Steamship Company, $13.00 round trip; Philadelphia, rail, $9.00 round trip; Richmond, $3.50 round trip.

Several watering places within few minutes' ride of Norfolk and Exposition grounds.

For further information, address Committee on Transportation, Jamestown Dental Convention, J. Lewis Walker, Norfolk, Va.; A. Allison Stores, Norfolk, Va.; W. M. Surgis, Norfolk, Va.

By H. Wood Campbell, Secretary Committee on Organization.

Suffolk, Va.

LATEST DENTAL PATENTS.

851,483. Moistening attachment for dental engines, George Bartlett, Lenepah, I. T.

851,501. Toothbrush, Ernest L. Detrick, Cleveland Ohio.

851,578. Artificial teeth, Walter O. West, New Orleans, La.

851,735. Dental appliance, Chester M. Dowell, Elkhart, Ind.

852,159. Dental-tool handle, Joseph Bode, Philadelphia, Pa.

852,266. Artificial teeth, Ernest D. R. Garden, Tarrytown, N. Y.

852,413. Removable dental bridgework, Ernest C. Bennett, New York, N. Y.

852,550. Toothbrush guard, John C. Nevius, Trenton, N. J.

853,031. Dental instrument, Augustus B. Prentis, Marshfield, Ore.

853,372. Machine for making wooden toothpicks, John H. Nute, Portland, Me.

853,405. Tooth-powder retainer, Ernest R .Godward, Invercargill, New Zealand.

853,421. Dental chair, Frank Ritter, Rochester, N. Y.

853,549. Toothbrush and powder receptacle, John P. Hill, Baltimore, Md.

News Summary.

C. H. Kuper, 55 years old, a dentist of Parkers, Va., died June 28, 1907.

J. P. Tilson, a dentist of Fillmore, Utah, was found dead on the street, June 28, 1907.

James Ganoe, 73 years old, a dentist of Ogden, Ia., died from paresis, July 9, 1907.

SAMUEL BRIDGES, 77 years old, one of the oldest dentists in Brooklyn, N. Y., died June 29, 1907.

SULLIVAN L. WARD, 81 years old, one of the oldest dentists of Lowell, Mass., died July 11, 1907.

JAMES BROOKIN, a dentist of Anderson, Ind., was killed in an automobile accident, July 19, 1907.

J. E. ROBINSON, 73 years old, for many years a prominent dentist of Cleveland, O., died July 13, 1907.

DR. DEWAR, 38 years old, a dentist of Glencoe, Ont., died following an operation for appendicitis, July 10, 1907.

JOHN CLENDENNING, a dentist of Port Huron, Mich., formerly of Detroit, was drowned in Lake Huron, July 2, 1907.

E. H. DILLINGHAM, 69 years old, a dentist in West Liberty, Ia., died from congestion of the lungs, July 15, 1907.

A. D. HOLLAND, 65 years old, a dentist, formerly of Paducah, Ky., died at his home in Newport, Ark., July 12, 1907.

JAMES OREGON DUNN, 32 years old, a well-known dentist of Chicago, Ill., died following an operation for kidney trouble, July 18, 1907.

JOHN I. HART, 41 years old, a well-known dentist of New York City, died suddenly of heart disease in his office at his home, early in June.

A CRANK DEFINED.—A crank is a man who has a different hobby from your own.

COURTESY.—"Life is never so short but there is always time for courtesy." —EMERSON.

FATALITIES.—A woman of Fremont, O., expired in a dentist's chair, July 12, while under the influence of an anesthetic.—July 15, man in Kansas City, Mo., died from heart disease while in a dental chair.

IDEALISM.—Idealism is a beautiful thing in life; beautiful to look upon, to think over, to contemplate, to analyze, and while we cannot all be idealists, we can aim high and then do our best.—DR. H. J. GOSLEE, *The Bur.*

DENTAL LIBRARIES.—We commend the dental library question to the serious consideration of the dental profession as a whole. It is high time that we had a representative and complete dental library at our national capital, and as many local libraries as can be created.—DR. E. C. KIRK, *Dental Cosmos.*

HANDSOMELY REWARDED BY AMEER.—Dr. D. H. Davison, formerly of Streator, Ill., who has been in Burmah for some time establishing dental clinics for the king of Burmah and on his own account, has arrived home. While in Burmah he met another young American, who had been official dentist for the army of the Ameer of Afghanistan, at a large salary. The Ameer was so pleased with the man's work that he promised him a handsome present in addition to the salary. So often was this bonus mentioned that the American expected something magnificent. When the contract expired the Ameer summoned him, and with an important and mysterious

air, presented the American with a package containing a cheap American nickel watch.

FIRES.—D. A. Long, Lititz, Pa., July 4; loss, $100.—Dr. Gees, Mulberry, Kan., July 4; damage, $900; insurance, $350.—W. J. Ogg, Utica, O., June 27; total loss.—Dr. Nicholls, Fresno, Cal., June 30; loss unknown.—Laboratory of Western Dental Co., Los Angeles, Cal., badly damaged July 7.

HAVE A HOBBY.—To the middle-aged man a side line or hobby is a salvation. It prevents him from becoming cramped by the routine of work and the burden of years. It is a refuge from sorrow and loneliness of old age, which is often so pitiably bereft of diversion from an occupation.—DR. H. LATHBUN, *Dental Era.*

THE HIGHEST FUNCTION OF LIFE.—The highest function of a great life is service to man. Service to the end that the condition of the world would be better because a man had lived. This is exemplified in any of the great lives whose names form the roster of great men, or women, who have lived.—DR. H. J. GOSLEE, *The Bur.*

A REMINDER.—I believe the best way is to send your patient a reminder card or examination notice one year following the completion of the work and expect them to follow your instructions concerning the care of their teeth and co-operate with you by appearing for examination at the end of the year.—DR. H. W. MCMILLEN, *Dental Review.*

SPECIAL SKILL.—You must remember that universally successful achievements in any chosen direction, and particularly in a field which embraces science, art and mechanics, are to be obtained only by the acquirement of special skill, and that since we are not born skilled, it is purely the product of development.—DR. H. J. GOSLEE, *The Bur.*

PRESENTS EIGHTY SKULLS TO NORMAL COLLEGE.—Dr. John A. Watling of Washington, D. C., formerly of Ypsilanti, Mich., has presented to the Normal College eighty skulls, collected during the many years he was professor of dentistry in the University of Michigan. Eighteen varieties of monkeys, a fossil horse, an alligator and many other animals are represented.

SUICIDES.—Henry S. Latshaw, a dentist of Vincennes, Ind., killed himself June 29. Grief over the death of his wife and daughter is supposed to have been the cause.—Frank Strickland, a dentist of Williams, S. C., was found dead July 4. It is not known what caused his death. An empty carbolic acid bottle was found near the body, but no signs of acid burning were apparent.—Leon Ridgway, a dentist of Seattle, Wash., killed himself by drinking carbolic acid July 13.

DENTISTRY DEFINED IN ITS RELATION TO THE PRACTICE OF MEDICINE AND SURGERY.—Sub-section "six" added to section 44700 (a), chapter 95, of the Revisal of the North Carolina law relating to dentistry is as follows:

A duly licensed dentist under chapter 95 of the Revisal is a surgeon limiting his practice to diseases of the teeth and such other diseases of the

adjacent parts as may be dependent upon or associated with said diseases of the teeth, and who shall have the same right to prescribe drugs or medicines or perform such surgical operations as may be necessary to the proper treatment of the special class of diseases mentioned in this section, as is now enjoyed by registered physicians.—*Raleigh Observer.*

THE CEMENTED FILLING.—The preparation of a cavity to receive an inlay must, as we all recognize, be performed according to certain accepted special methods, just as we find this needful in cavities for malleted or plastic fillings. Admitting this, a cemented filling is better mechanically because of its binding effect upon the cavity walls, and also because it has no tendency to weaken and force asunder these walls, as is the case with the malleted filling.—I. N. BROONELL, *Dental Cosmos.*

"HITONED" AND THEREFORE "CHOISE."—The following formed the postscript to an order received by a dental supply house:

"P. S.—The above set is for a *hitoned* lady whoes teeth were vary small, & tolerable Short, She is quite fair and rudy, in a word—a pritty woman! & 'painfully' Choise!'"

The teeth were supplied according to the best judgment of the salesman and evidently pleased the lady, for no necessity arose to exchange them.

A NEW WAVE COMING.—I believe there is a new wave coming. That is the wave of oral prophylaxis, and that the profession is going to awake to the necessity of this treatment. The researches and experiments of Dr. D. D. Smith of Philadelphia and of other members of the profession are going to be the means of arousing the profession to the need of insisting on our patients giving more care to the condition of the gums and mucous membrane of the mouth.—DR. J. B. MONFORT, *Tri-State Record.*

REMOVAL OF THE PULP BENEFICIAL IN PYORRHEA TREATMENT.—I do not hesitate to remove the pulp from any of the teeth greatly affected, and where there is enough bone remaining to justify an effort to save the tooth, I have rarely known a case that was not benefited and the usefulness of the tooth prolonged by the extirpation of the pulp. Just why this is I do not know, neither do I know of anyone who does. It may be due to some change in the blood supply to the locality, for among teeth involved to that extent, a few contain normal pulps.—DR. GORDON WHITE, *Dental Cosmos.*

PRESERVE THE DECIDUOUS TEETH.—The erroneous but popular opinion that only the second teeth are of real importance should be combated, and physicians and parents should be made to understand that the integrity of the palatal arches in later life depends largely upon the care and preservation of the first or deciduous teeth.—G. H. MAKUEN, M. D., *Dental Brief.*

THE VOICE AS AN AID IN PHYSICAL DEVELOPMENT.—Normal physical development is also promoted by the free use of the voice in speech and song. The healthy young infant, for instance, begins to cry immediately upon its advent into the world in order that it may free its respiratory tract of mucus and aerate its lungs, and he goes on crying or laughing or grunting or babbling, and finally talking, more or less all the rest of his natural

life, whereas the unhealthy young infant, the imbecile or the deaf mute, will refrain from these healthful diversions, gradually dwindle and prematurely die. It is well known that stammerers and those having other forms of defective speech are generally short lived.—G. H. MAKUEN, M. D., *Dental Brief.*

DR. H. A. SMITH HONORED.—The dental profession of Cincinnati and vicinity tendered to Dr. Henry A. Smith a banquet at the Queen City Club upon the fiftieth anniversary of his entering the practice of dentistry. On March 6, 1857, Dr. Smith was graduated at the Ohio College of Dental Surgery. He came to Cincinnati as a young man from Oxford, Ohio, and entered the office of Dr. Charles Bonsall, a pioneer dentist of this city, eventually succeeding to Dr. Bonsall's practice.—*Dental Register.*

ENTHUSIASM SHOULD BE COMBINED WITH DISCRETION.—As a matter of fact, there is no reason why we should be extremists in any one branch. Porcelain has its place and so has gold. Gold inlays are most valuable, and so are amalgam, gutta-percha and cement; therefore let us combine discretion with enthusiasm, uniting all that is best in our several methods and present to the world a solid front, which will add to the glory of well-doing and redound to the advantage of our profession.—DR. W. A. CAPON, *Dental Cosmos.*

DAMAGE SUITS.—A dentist of Lawrence, Mass., is being sued to recover $25, the cost of a set of false teeth, because, as was alleged, the teeth did not fit. The defendant claimed they were all right and that they were used by the plaintiff. The case was taken under advisement.—A woman of Hartford, Conn., has filed suit for $1,500 damages against a dental firm of Hartford. She claims that in treating and extracting a tooth an unclean instrument was used, as a result of which she is greatly injured in health and constitution.

BE CAUTIOUS WITH HIGH-PRESSURE ANESTHESIA.—Be cautious of the high-pressure anesthesia. Prof. Miller of Berlin, in his experimenting, found that such pressure as could be done with thumb or finger or an equal pressure was sufficient. High-pressure instruments carry enough liquid to anesthetise the entire jaw or the whole head if it were forced through the pulp and apex of tooth. No such quantity is ever needed. The fifth part of a drop, or the tenth part, made to go where wanted, will do the work.—DR. R. B. TULLER, *Amer. Dental Jour.*

ACCIDENTS.—F. F. Foust, a dentist of Benton, Ky., had his leg almost ground off by being caught between the body of a wagon and a wheel, while riding home from a picnic party, July 4, 1907.—J. W. Ritter, a dentist of Charleston, Ill., is suffering with two broken ribs, which he received in a friendly scuffle with a friend July 8, 1907.—While using gasoline July 8, 1907, S. C. A. Rubey, Secretary of the State Dental Board of Missouri, was badly burned about the face and hands from the explosion.—A woman in a dental office in Kankakee, Ill., unconsciously swallowed a bur which had become loosened from the hand-piece, when the dentist was excavating a cavity. The thought of the possible consequence

made her deathly sick and she succeeded in disposing of it by vomiting.—Gustavus North, a dentist of Cedar Rapids, Ia., recently fell, fracturing two ribs.

CORRECT USE OF THE WORD "CEMENT."—A short time ago, I had the pleasure of attending a meeting of the Franklin Institute in Philadelphia. This institute, as many of you know, is a highly scientific body of men. On this occasion they had under discussion the subject of hydraulic cements and their use. I was particularly struck by one feature of their discussion, namely, their use of the terms cem'ent and ce-ment'. I thought perhaps we might take a lesson from what these men had taught me, and use these words correctly, cem'ent meaning the substance and ce-ment' the act of cementing the filling.—I. N. BROONELL, *Dental Cosmos.*

CEMENTED FILLINGS.—I wish to conclude by saying that I am firmly in favor of cement for assistance in the placing of metallic fillings, and that while we recognize the care we must exercise in the use of our plugger points in relation to the margins of enamel, we must be even more careful that no cement is between our plugger point and our gold. In other words, if any small particles of cement break down around the margins we will meet with failure; but a cemented filling carefully placed is in my estimation a boon to the patient as well as of great assistance to the operator.—DR. J. I. HART, *Dental Cosmos.*

ANCIENT DENTISTRY.—Signor Ernesto Mancini, in the Italian review called *Nuova Antologia,* states that the Arabs regarded odontology as a branch of surgery; that Cicero attributed the art to Esculapius 1300 B. C., that Hippocrates practiced dentistry in the fourth century B. C., and that, even before the Greeks, the art reached a high degree of perfection among the Egyptians, and from them passed down to the Phœnicians and Etruscans. It would appear, therefore, that the development of dentistry has been, at least, contemporaneous with that of medicine and surgery, and that it probably reached even a higher degree of excellence than either in the ancient time.

RECIPROCITY.—The value and safety of a dentist to the community and to his following does not depend nearly as much on his theory as it does on a good sound comprehension of the mechanical reasons of dental operations, and the therapeutics and treatment of diseased pulps and their sequelæ. Any man who comprehends and uses a square base for his fillings, who follows out sulci, in young patients, to their extremities, who can remove a pulp with cocain or with arsenic, and afterward properly fill the roots, who can manage a putrescent pulp case to a successful ending, who can properly grind and fit a Logan or a Davis crown, or make a comfortable banded crown, gold or porcelain, and who can make a well-articulated denture is a competent dentist to practice anywhere, and cannot do harm nor bring disgrace upon his profession, and to tell such a man, when failing health of self or family, or any reason whatsoever, has made a change of location essential or desirable, that he must spend six months in study of quiz compends on anatomy, physiology, pathology, chemistry, etc., simply

because his years of experience have driven most of his theory out of his brain is unjust and not American. It is state rights used to an end never contemplated by the original designers of the Constitution.—Dr. F. R. Houston, *Dental Review.*

The First Lesson to Be Learned by an Anesthetist.—The first lesson I think we should learn in our preparation would be that there is an element of danger every time a person is put under the influence of an anesthetic, and we should learn this lesson so well that we will never deceive ourselves into believing and telling our patients that there is no danger in order to get them to submit to an anesthetic for any operation. Let the patient demand the anesthetic; then if we should ever have the misfortune to have a patient fail to recover from the anesthesia after we had done everything that could be done for their recovery, our conscience would be clear in the matter.—Dr. A. W. Glass, *Tri-State Record.*

Illegal Practitioners.—July 9 a man in Sawtelle, Cal., was fined $50 for practicing dentistry without a license.—A man of San Francisco was arrested June 20 for practicing without a license, which is the beginning of a crusade in that state against unlicensed dentists.—A man of Guthrie, Okla., for whom A. C. Hixon, secretary of the Board of Dental Examiners, swore out a warrant for practicing without a license, has left the territory.—Two men of New York City were arrested July 12 for practicing without licenses and held for examination in the sum of $200. Their arrest was secured by two young women in the employ of the New York State Dental Association, whose duty it is to secure evidence of this character. Both of these women are so well known by the dental fraternity that they are obliged to wear disguises in order to accomplish their purpose. The men pleaded not guilty.

Marriages.—Alfred Armand Frost, a dentist of Salem, Mass., was married to Mrs. Elizabeth Hunt of Jamaica Plain, July 10.—Charles J. Glenn, a dentist of New Berlin, Ill., was married to Mrs. Effie E. Wright of Franklin, June 20.—Clyde Peck Hendricks, a dentist of Morrison, Ill., was married to Miss Viola May Bickford of Sterling, June 26.—Aubrey Justice, a dentist of Lancaster, Mo., was married to Miss Sybil Hays of the same place, June 23.—B. C. LeVanseler, a dentist of St. Johns, Mich., was married to Miss Bessie A. Wooten of Midford, June 27.—John Franklin Caulfield, a dentist of Woburn, Mass., was married to Miss Margaret J. Maloney of Winthrop, June 26.—Lucien A. Manahan, a dentist of Peoria, Ill., was married to Miss Florence E. Rottman of St. Louis, Mo., July 10.—Michael J. Regan, a dentist of Holyoke, Mass., was married to Miss Elizabeth F. McCarthy of Chicopee, June 24.—A. F. Schaefer, a dentist of Streator, Ill., was married to Miss Mary M. Stiles of the same place, July 5.—George H. Flanders, a dentist of Whittier, Cal., was married to Miss Florence E. Strickland of Buffalo, N. Y., July 24.—John H. Wooden, a dentist of Baltimore, Md., was married to Miss Edna Wheeler of Baltimore, July 10.—A. M. Wilkes, a dentist of Leroy, Ill., was married to Miss Goldie Killion, of the same place, July 10.—Dr. Weirick, a dentist

of Goldfield, was married to Miss Minnie Bader of Denver, Colo., June 28.—Frank W. Beitel of Chicago, Ill., was married to Agnes Seitel, a dentist of Muscatine, Ia., June 28.—Frank Henry, a dentist of Cairo, Egypt, was married to Miss Hazel Meyer of Mound City, Mo., June 26.

SURGEON AND ARTIST—RESPONSIBILITIES ASSUMED BY THE PROSTHETIST.—"The prosthetic dentist assumes two serious propositions: First, as a surgeon, he takes the responsibility of deciding that it is expedient and proper to maim his patient for life by removing his natural teeth; second, as an artist, he assumes the responsibility of carrying his patient through the transition period (proximately a year) from the time the teeth are extracted until he is furnished with a permanent artificial denture without appreciable loss of form or expression of the features." * * * A prosthetist is one who practices prosthesis, and prosthesis (in dentistry) is the science, art and esthetics of restoring a lost dental organ or organs and their associate parts with an artificial substitute. The science is classified knowledge of the subject; the art is skillfully doing the work, and the esthetics is harmonizing of the instrument with the associate parts. It is apparent that a dentist limiting his practice to prosthesis has no moral right (but the law gives him a legal right) to assume the responsibility of an operator or an oral surgeon and extract teeth; his field of service is to build up or replace that which has been lost.—DR. G. H. WILSON, *Dominion Dental Jour.*

ROBBERIES.—E. N. Allison, Lowellville, O., July 12, $40 in cash and four gold crowns.—C. E. Bartholf, Elry, Wis., July 9, gold bridge, crown, etc., valued at $40.—H. W. Barton, Akron, O., July 4, $8 worth of gold scraps.—Fred Capron, Akron, O., June 29, $40 in gold plate stolen.—H. A. Dillingham, Theo. Kuechle, Jr., J. S. Danforth and W. D. Hollingsworth, Sheboygan Falls, Wis., July 9, gold filling.—Decker & Finney, George Stratton and J. L. Bender of Oshkosh, Wis., July 11, about $25 worth of gold and platinum taken from each office.—J. B. Dewees, Canton, O., early in July, gold plate and solder, valued at $20.—Dr. Duncan, LaSalle, Ill., July 1, $40 worth of gold plate.—C. B. Emery, Marion, O., July 12, $12 in cash and gold leaf valued at $15.—B. F. Grenehow, Kewanee, Ill., June 20, gold fillings valued at $15.—Dr. Gifford, Greenfield, Ia., June 24, $50 worth of gold.—E. L. Hinshaw, Kansas City, Mo., June 22, three gold bridges and five gold crowns.—D. H. Henninger, Akron, O., June 29, $60 worth of medical equipment.—George Huwatchek and E. Kapitan, Manitowoc, Wis., July 9, gold fillings valued at $25 to $50.—Louis S. LaPierre, South Bend, Ind., June 27, gold scrap valued at $5.—H. K. Lathrop, Jr., Detroit, Mich., June 15, $20 worth of gold.—Dr. Lee, St. Joseph, Mich., June 23, gold valued at $40.—C. C. Mottinger, Akron, O., early in July, two gold bridges, and gold and platinum valued at $50.—W. A. McFarlane, Waukesha, Wis., July 7, $18 worth of gold.—C. R. Padgett, Tiffin, O., July 12, $25 worth of gold.—Theodore Phillips, Canton, O., June 30, large quantity of gold.—E. M. Rogers, Stevens Point, Wis., July 11, $10 worth of gold plate and foil.—W. T. Shaw, Lansing, Mich., July 8, gold valued at $100.—E. A. Upton, Oakland, Cal., July 8, $20 worth of gold, several

pairs of forceps and two dozen excavators.—Marshfield, Wis., offices raided and robbed of gold valued at $60.—Wolf Bros., dental supplies, Philadelphia, July 1, $600 in dentists' tools.

Divorces.—W. H. Buckley, a dentist of Little Rock, Ark., filed a suit for divorce against his wife June 22; he charges misrepresentation and misconduct.—Mrs. Florence Bernstein, wife of Arthur I. Bernstein, a dentist of Mt. Vernon, N. Y., has been awarded alimony pending the determination of her suit for separation. Bernstein has instituted a counter suit for absolute divorce.—Edward T. Mason, a dentist of Newark, N. J., has filed papers asking for absolute divorce from his wife. Mason charges his father-in-law with alienating her affections.—Mrs. Nora G. Ready, wife of William B. Ready, a dentist of Syracuse, N. Y., has filed papers for a separation. She charges cruel and inhuman conduct.—John H. Whipple, a dentist of Chicago, defendant in a divorce suit brought by Mrs. Terra Del Whipple, recently filed a bill declaring his wife to have been a constant source of worry to him and not entitled to temporary alimony. Mrs. Whipple a year or so ago having been allowed $10 a week temporary alimony, recently made another application for alimony. She alleges she is ill and unable to earn a living.—John H. Jackson, a dentist of Boston, has filed suit the second time for divorce from his wife. He charges too much mother-in-law.—W. R. Wickersham, a St. Louis dentist, has been granted divorce from his wife. Mrs. Wickersham's love for a cowboy is the cause.

Two Methods of Reducing the Sensitivity of Dentin.—There are two ways of reducing sensitivity that are directly opposite; one is to dehydrate the cavity (and there is pain generally in doing it) and the other is to keep it flooded with warm water. In the first instance the drying out of the ends of the tubuli that end in the cavity being excavated, while at first painful, very generally renders the protoplasmic substance less so, the drier it gets. Frequently the water withdrawn or evaporated may be replaced with good effect by some obtunding medicament. In fact, the value of most any of the obtunding agents used simply to flood the cavity is little without first dehydrating. Of course it is understood that some medicaments, like absolute alcohol and chloroform, are dehydraters. That is to say, they will absorb or take up moisture (water) to a limited extent, but with considerable force. Thus they are exceedingly useful in withdrawing the moisture from the dentin that absorbent cotton would not reach. It is well to say here that alcohol does not affect rubber dam, while chloroform will so soften it that it will tear and become leaky. Use alcohol with rubber on. Now, where flooding with warm water is employed it is usually done before the rubber dam is adjusted. It acts as a lubricator and reduces friction, and thus keeps the bur from heating. It is the heat of friction that produces most of the pain when burring out a tooth. The saliva of the mouth is hardly sufficient as regards flooding. The proper way is to have a continuous fine stream of tepid water playing directly into the cavity, and in this way the debris is washed out as well as the

bur being kept cool and friction reduced. In the dried out cavity it is well to repeat, the protoplasmic contents of the tubuli becoming dried and shrunken, sensitivity is reduced. It often becomes necessary to repeat the drying as the dentin is cut away, or it is necessary to follow with some medicament that has obtundent properties.—Dr. R. B. Tuller, *Amer. Dental Jour.*

Filling Materials and Artificial Dentures Affecting the Voice.—It has been suggested that the material, even for the filling of teeth cavities, should be selected with a view to securing that which has the same density as normal teeth because of the deleterious effect upon the voice of substances in the mouth of unsuitable degrees of density, and we all know that artificial dentures, such as plates and obturators, have a marked deleterious effect upon the resonance of the voice. This is due in part, of course, to the encroachment of these appliances upon the size and shape of the oral cavity, but that the excessive density of the material used is largely responsible for it I feel convinced. Rubber, for instance, is not a good conductor of sound, and when a plate of it is fitted to the palatal arch it has the effect not only of closing the palatal foramen but also of damping the normal vibrations of the palate itself. It is as if you would fasten a piece of solder to the body of a French horn or a piece of steel beneath the bridge of a Stradivarius or Cremona violin. The characteristic tone is immediately lost and the beauty impaired.—G. H. Makuen, M. D., *Dental Brief.*

Troubles of Various Dentists.—A dentist of Brooklyn who was arrested a few weeks ago charged with practicing dentistry without a license, has been again arrested, charged with passing worthless checks, and held in $500 bail.—A New York state dentist has been sentenced to fifteen years in Sing Sing for shooting his wife.—A dentist of Port Huron, Mich., left the city recently without apprising his creditors, which are many, of the fact, and much anxiety is expressed toward locating him.—A dentist of Skiatook, I. T., is being sought by a young woman whom he buncoed out of $1,100, promising marriage.—Suit has been brought against a prominent New York dentist by an expert masseuse, to recover one-third of a fee of $900, charged for work on the tooth of a famous singer, which she alleges was promised her. The dentist repudiates the alleged bargain.—The police of Haddington, Pa., are looking for a canine dentist who pulls the teeth of his patients without their permission. As a result of his efforts, there are nearly fifty toothless dogs running around that vicinity, and bones are becoming a glut on the market. It is reported that the tooth puller is the father of a boy who was severely bitten by a dog a few weeks ago.—A dentist of Granite City, Mo., has been publicly horsewhipped by a dry goods merchant of that town, who claims the dentist had been a too frequent visitor at his home.—A dentist of Brooklyn, N. Y., who was arrested a few weeks ago, charged with annoying a woman, has been fined $10 and placed under bonds to keep the peace for a year.—A young dental student of Philadelphia is being held in $1,000

bail for the theft of a diamond ring from his boarding mistress.—A dental student and wife of St. Louis have been arrested, charged with second degree burglary in a transaction with a butcher.—The suit brought by a Buffalo dentist, against the mother of a young woman patient, to recover on a bill, has been dismissed. The lady asserted the husband made all arrangements, while the dentist declared the mother did.

EXAMINING BOARD AFFAIRS.—At a meeting of the California Board of Dental Examiners, held recently at Los Angeles, only twenty-three out of forty-one applicants passed the examination, and but twenty-eight out of sixty-one in San Francisco received diplomas.—At the last meeting of the Massachusetts Board, out of eighty-eight candidates, fifty-one were successful.—July 18 Gov. Warner of Michigan appointed under the new dental law the following State Board of Examiners: C. H. Oakman, Detroit, five years; A. W. Haidle, Negaunee, four years; Addison B. Robinson, Grand Rapids, three years.—The application of Annie Brown of St. Louis for a writ of mandamus against the Missouri State Board, to compel it to grant her a license to practice dentistry, was denied. The applicant contended that she was a dentist in St. Louis, properly registered under the laws of 1897. The writ was denied because of later laws, with which the applicant must comply before she can continue in the practice of dentistry.—Only four out of thirty-six applicants examined by the North Carolina Board failed to pass.—In Pennsylvania one hundred and ninety-six cut of two hundred and eighteen were successful.—At the Pennsylvania meeting it was decided that voluntary contributions should be taken, and that $500 should be appropriated from the treasury for the prosecution of dentists not registered and of persons violating dental laws.—The affairs of the British Columbia Dental Association, and the manner in which the last examination was conducted, are to be aired in court at Victoria, B. C. Four of the unsuccessful candidates have instructed an attorney to proceed against the board, and to ask for a commission of inquiry into the whole matter. This action followed an application by the young men to the board for copies of their marks, which they were told they could not have, the board having the power to arbitrarily refuse the marks if so desired. The charge that there was wholesale "cribbing" and hence that they were refused their diplomas, is also ridiculed by the candidates.—The Oklahoma and Indian Territory Dental Association, which have been merged, passed resolutions asking the legislature to require the examination of all dentists in Indian Territory before Oklahoma certificates are issued to them. The constitution guarantees certificates to all who were practicing prior to June 16, 1906.—The Supreme Court of Missouri has refused to pass upon the legality of the charge against a dentist of Jefferson City, charged with practicing dentistry without a license from the State Board, who are the plaintiffs in the case. The Supreme Court raises the objection that the case did not come to the court through the regular channel.—The third attempt to convict a San Bernardino (Cal.) dentist of practicing without a state license, has, like the others, resulted in a failure. The jury split, five favoring acquittal and four conviction.—A dentist of

St. Joseph, Mo., loses suit to force State Board to examine him, a diploma, which he does not possess, being necessary for dental license.—In the mandamus case brought against the State Dental Board of North Dakota, by Dr. Chandler of Valley City, it has been decided that Dr. Chandler is entitled to a seat on the board, his commission from the governor being *prima facie* evidence of his rights. The board may appeal.

An Interesting Case.—Several weeks ago a man about 40 years of age consulted me concerning a severe pain on the right side of the superior maxilla, in the region of the molars; said the pain would shoot over the right side of the face and up into the eye. On examination I found the second and third molars had recently been extracted, in fact only a few days; the gums did not seem in the least swollen or inflamed, and my first thought was that possibly a broken-off root was causing the trouble. On stating this to the patient he took the teeth that had been extracted out of his pocket, and I saw they were not only not broken but were absolutely sound and perfect. I asked why they had been extracted and was told that it was to get rid of this same pain he still had. I then made a more thorough examination, but could not find anything abnormal; the sight of the left eye had recently been lost by a flying piece of steel, and it occurred to me that possibly the pain was reflex in character, and that the eye had something to do with it, so I referred the man to an eye specialist, with the request that his refraction be thoroughly gone over. On this being done it was found the man had a very pronounced case of astigmatism, probably being aggravated by the loss of the other eye. A glass of the proper correction was fitted, and since then there has been no return of the pain in the jaws or face.—Dr. E. A. Raffensperger, *Dental Summary.*

On the Futility and Danger of Treating Cocain Poisoning with Morphin.—It was by observing that morphino-maniacs possessed a high degree of tolerance to the effects of cocain that Magnan-Chauppe was led to experiment with morphin as an antidote to cocain. These two agents induce physiological effects of opposite natures, and as was pointed out by Laborde, a fatal dose of cocain has not resulted in death when administered following the injection of a dose of morphin. But, unfortunately, the antagonizing therapeutic effects of morphin are not so pronounced when the agent is administered in severe cocain poisoning, namely, after the effects of the latter alkaloid have fully developed. Pouchet, who has studied the question, is of the opinion that while atropin, choral and chloroform are capable of decreasing the intensity of the convulsive paroxysms in cocain poisoning, morphin either stimulates them or decreases them (uncertainty of action). Consequently, Pouchet recommends the rejection of all narcotics in the treatment of cocain poisoning. Chloral, of course, is, to a certain extent, an antidote to cocain by virtue of its vaso-dilator action; but in this connection it must be borne in mind that while certain symptoms may be attenuated, the toxic action of the partial antidote will render the toxic effects of the original poison still more pronounced.

A case of fatal cocain poisoning, reported by Lacassagne and Rolland in the

Archives d'Anthropologie criminelle for January, 1905, shows that morphin, at least in that particular case, hastened the fatal termination. Until more careful studies of cocain poisoning shall have been made, it would be well, in Mr. Vaillard's opinion, to limit the treatment of cocain poisoning to inhalations of oxygen. Such agents as chloroform, ether, and amyl nitrite should be employed with the greatest caution, if at all.—*Dental Cosmos.*

MOUTH DISINFECTION.—The *Therapeutic Gazette* called attention several years ago to the necessity of paying due attention to the condition of the mouth prior to the administration of ether or chloroform for the production of surgical anesthesia, pointing out that the pulmonary complications which follow the use of these drugs on certain occasions are chiefly due to the inhalation of pathogenic micro-organisms, which, when in the mouth, are incapable of much harm, but which in the lung create severe disease. When it is considered that the pneumococcus is found in nearly every so-called healthy mouth, and that many other organisms are associated with it, it is rather remarkable that pulmonary infections are as rare as they are. An interesting research to determine the best methods of disinfecting the mouth, particularly in reference to pneumonia, has been published in the *Journal of Infectious Diseases,* October 30, 1906, by Wadsworth.

He used a considerable number of substances as mouth-washes, and made culture experiments from the mouth to determine the bactericidal value of his measures. It is interesting to note that in his experience most of the mixtures or substances used at the present time as mouth-washes possess very little, if any, true disinfectant or germicidal power. He also found that none of the so-called commercial solutions are efficient when tested upon pneumococci under conditions supposed to be most favorable for their action, and that even such active disinfectants as formalin, lysol and hydrogen dioxid failed to act on the pneumococcus in exudates. It is also interesting to note that alcohol alone of all the antiseptics proved efficient when tested on the pneumococci under all conditions. Again, Wadsworth found that the rapid diffusion of alcoholic solutions was greatly accelerated by the addition of glycerin. In other words, cleansing the mouth with a normal salt solution simply cleanses it, but does not destroy the bacteria, whereas washing the mouth with an alcoholic wash containing 30 per cent. of alcohol actually produces true disinfection, particularly if to the 30 per cent. solution of alcohol in water a small quantity of glycerin and salt is added.

It would seem evident that this investigation possesses great practical importance, since it enables us not only to prepare patients for operation in such a way that pulmonary complications can be largely avoided, but also because it helps us to prevent the spread of acute infectious diseases, such as pneumonia, from one individual to another, the spread being most frequently induced by small particles of sputum laden with the pneumococcus being expelled in coughing or sneezing, and so finding a way to reach healthy individuals.

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